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December 1995

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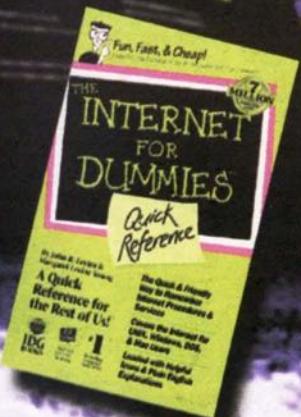
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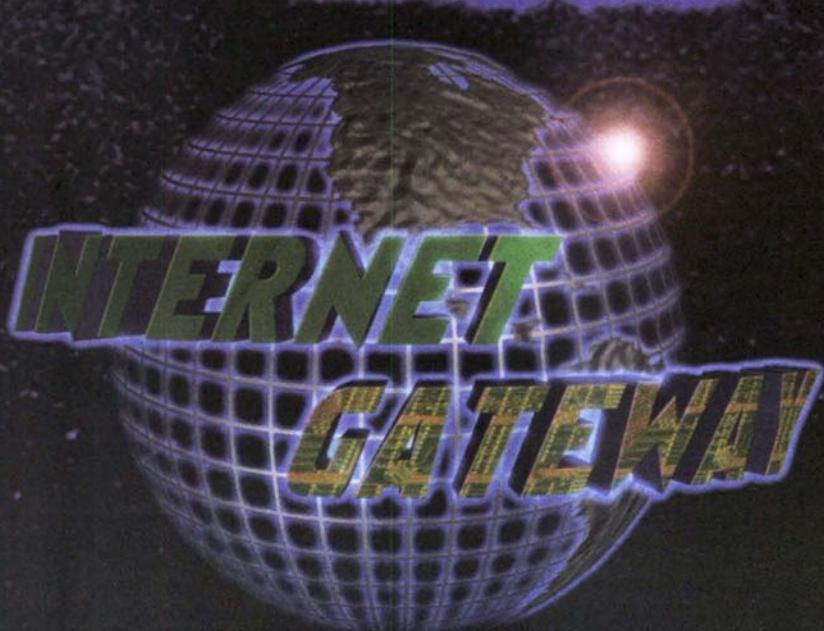
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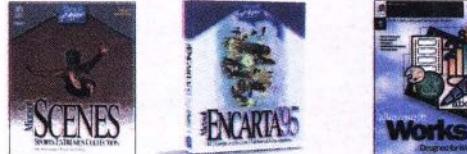
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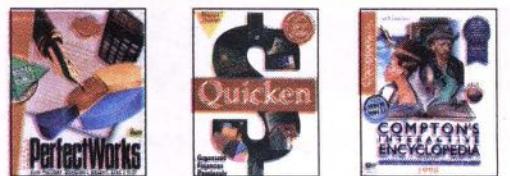


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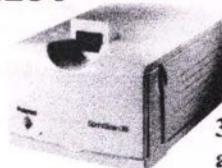
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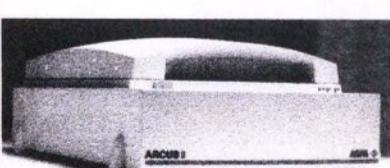


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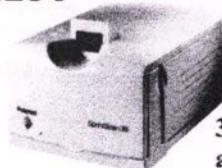


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Netscape Reduces Server Software

Netscape Communications Corp. has sharply cut prices of its server software aimed at companies looking to do business on the Internet.

The publisher has dropped the price of its:

- Netscape Commerce Server 1.12 for Unix from US\$5,000 to \$2,995.
- Microsoft Windows NT Commerce Server from US\$2,995 to \$1,295.
- Netscape Communications Server 1.12 for Unix from US\$1,495 to \$1,295.
- The NT Communications Server from US\$795 to \$495.

Atri Chatterjee, director of server product marketing, told the wire service, "Today's aggressive pricing moves will help to further accelerate the adoption of our high performance, industrial-strength servers and security technology, creating a ready platform for a host of online applications."

Intel Offers Faster Pentium

A new 120MHz Pentium microprocessor has been unveiled by Intel Corp., which says this is the fastest microprocessor available for notebook computers. The Reuter news service quotes Intel as saying the processor contains 3.3 million transistors and is especially small, making it possible for systems to deliver the highest level of performance with very low power consumption for long battery life.

Cyrix Adds Faster 5x86 CPU

Cyrix Corp. has added a second member to its 5x86 processor family—a 120 MHz version.

The chip maker, based in Richardson, Texas, says the 5x86 microprocessor offers performance exceeding that of a 90MHz Pentium CPU. Cyrix is claiming a Winstone 95 performance rating of 150.4 on a 120 MHz 5x86 processor-based system.

Acer, AST Computer, CompuTrend Systems, CTX, Epson, FutureTech, MicroExpress, Sharp and Peacock in Germany are among the first PC manufacturers to design the 5x86 into notebook and desktop systems.

Cyrix says the 120MHz 5x86 processor is sampling now, with production quantities expected in November. The chip is priced at US\$160 in 1,000-piece quantities.

Novell to Sell WordPerfect

Just 16 months after buying out the word processing giant for \$855 million in a bid to wrest a bigger share of that market from Microsoft Corp., Novell Inc. now says it will sell most of WordPerfect Corp. along with other parts of its office applications software business.

Analysts say this is a major change in Novell's marketing plan, turning away from what has been deemed its losing strategy in the word processing and spreadsheet businesses.

Novell now plans to concentrate on its industry-leading products for networking PCs

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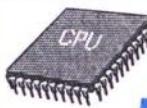
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| P - 100 | \$2149 |
| P - 120 | \$2299 |
| P - 133 | \$2549 |



Memory, CPU & Motherboards

(Build in EIDE on PCI Motherboard)

| | |
|--------------------------|-------|
| 486 VL-VESA | \$155 |
| GIGABYTE 486 PCI | \$169 |
| GIGABYTE 586 Pentium PCI | \$265 |
| 1MB 30 Pin | \$55 |
| 4MB 72 Pin | \$175 |
| 8MB 72 Pin | \$365 |
| 16MB 72 Pin | Call |
| EDO RAM | Call |

Please call for updated CPU pricing



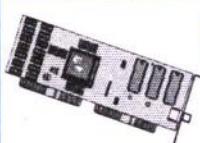
Multimedia

| | |
|---|-------|
| Teac 4X CD-ROM Drive AT Type | \$205 |
| Teac 6X CD-ROM Drive | \$375 |
| Panasonic 4x CD-ROM Drive | \$205 |
| Toshiba 4X CD-ROM Drive IDE | \$220 |
| Toshiba 4X CD-ROM Drive SCSI | \$469 |
| Sound Blaster 16 (OEM) | \$105 |
| Pro-Audio Studio 16 SCSI | \$175 |
| Logitech SoundMan 16 WAVE | \$185 |
| Sound Blaster 32AWE Value | \$230 |
| Sound Blaster AWE-32 | \$369 |
| 120W Speaker W/built-in Adapter, vol. control | \$99 |
| 70W Speaker W/AC-DC Adapter, vol. control | \$79 |
| 4W Speaker | \$9 |
| 40W speaker W/built-in Adaptor/vol.control | \$39 |
| Microsoft Encarta95 4CDs | \$95 |



Misc. & Accessories

| | |
|-------------------------------|-------|
| Cables | |
| Ribbons | |
| Toners | |
| Removable IDE Hard Drive Kit | \$39 |
| External SCSI HD Box w/PS 3.5 | \$99 |
| External SCSI HD Box 5.25 Bay | \$115 |



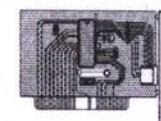
Network Cards

| | |
|------------------------------|-------|
| Microdyne NE2000 ISA 10BastT | \$85 |
| Intel EtherExpress Flash T | \$99 |
| Gateway Ethernet 16 Coax | \$99 |
| 3Com 509 Combo EtherLink III | \$178 |
| SMC EtherEasr 16BIT | \$135 |



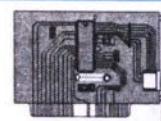
Monitors

| | |
|-----------------------------|--------|
| 14" N/I .28 Low Radiation | \$299 |
| CompuPartner 15" N/I .28 LR | \$445 |
| CompuPartner 17" N/I .28 LR | \$825 |
| NEC 15XV 15" N/I .28 1024 | \$649 |
| NEC 15XE 15" N/I .28 1024 | \$799 |
| NEC 17XE 17" N/I .28 1024 | \$1449 |
| SONY 15" sf N/I .25 1280 | \$689 |
| Samsung 17" CLS .26 1280 | \$1289 |
| ADI 4GP N/I LR 1280x1024 | \$535 |
| ADI 5EP N/I LR 1280x1024 | \$925 |
| MAG DX17F N/I .26 1280x1024 | \$979 |



Local Bus Video Cards

| | |
|-----------------------------|-------|
| VL-VESA 1MB DRAM (Exp. 2MB) | \$99 |
| S3 Trio64 PCI 2MB VGA Card | \$189 |
| ATI Ultra Pro 2MB VRAM VL | \$299 |
| Diamond Viper 2MB VRAM VL | \$289 |
| ATI MACH64 2MB DRAM PCI/VL | \$249 |
| ATI Pro Turbo 2MB VRAM VL | \$359 |
| ATI WIN Turbo 2MB PCI | \$379 |
| MiroCRYSTAL-20SV 2MB VRAM | \$349 |
| Diamond Stealth64 2MB DRAM | \$239 |
| Diamond Stealth64 2MB VRAM | \$369 |



Fax Modems

| | | |
|----------------------------|------|-------|
| Smart link 14.4 with Voice | Int. | \$85 |
| Smart link 28.8 with Voice | Int. | \$175 |
| USR Sportster 14.4 | Int. | \$135 |
| USR Sportster 14.4 | Ext. | \$165 |
| Sportster 28.8 V.34 | Int. | \$259 |
| Sportster 28.8 V.34 | Ext. | \$289 |



Hard Drives

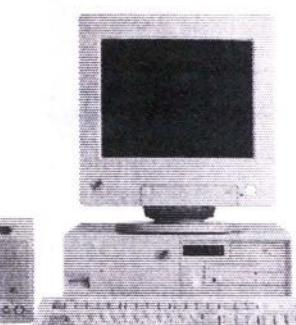
| | |
|-----------------------------|--------|
| Samsung 560MB 128K 12ms IDE | \$240 |
| Western Digital 850MB 10ms | \$279 |
| Western Digital 1.2GB 10ms | \$399 |
| WD 1.6 GB 10ms | \$545 |
| Quantum 1.05GB 12ms SCSI | \$625 |
| Quantum 2GB 9.5ms SCSI | \$1149 |
| Quantum 4.28GB 8.6ms SCSI | \$1625 |



Cases & Power Supplies

| | |
|---------------------------|-------|
| 13" Mini Tower 200 Watts | \$65 |
| 15" Mini Tower 200 Watts | \$75 |
| 19" Mid Tower 200 Watts | \$85 |
| 24" Full Tower 230 Watts | \$120 |
| 19" Colour Case 200 Watts | \$125 |

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Quantum



HEWLETT PACKARD

instead of those from its acquisition of WordPerfect and the \$145 million asset purchased from Borland International Inc.

Other software companies are negotiating to buy the WordPerfect software, QuattroPro spreadsheet and other business applications.

AP says the businesses to be sold represented \$86.1 million of Novell's \$538 million in third-quarter revenue.

WordPerfect's Bastian Quits Novell

Novell Inc. reports that WordPerfect Corp. co-founder Bruce Bastian has resigned from its board of directors.

Bastian joined the Novell board as a result of the company's 1994 acquisition of WordPerfect Corp., which he founded with Alan Ashton in 1979. Bastian's departure comes a couple of weeks after Novell announced that it

plans to sell most of the assets and products from the WordPerfect buyout.

Novell says Bastian is leaving to pursue other interests.

Microsoft Fixes Windows 95 Flaws

Two potential security problems with the Windows 95 operating software have been identified and fixed, publisher Microsoft Corp.

says. The company told visitors to its World Wide Web page on the Internet that it discovered and fixed a problem with the file and printer sharing in the software.

IBM Exec May Head Digital PC Unit

Bruce Claflin has resigned as general manager of product and brand management at IBM Corp.'s PC unit, and may be headed to rival Digital Equipment Corp. to lead the company's PC business. IBM says Claflin resigned to pursue other interests. An internal memo issued by the computer maker says a replacement will be named shortly.

Chinese Court Finds Piracy

For the first time, a Beijing court has found a Chinese company guilty of copyright infringement, prompting a Microsoft Corp. official to say she is hoping for punitive damages when the court rules on that part of the case early next month.

Reporting from Beijing, writer Jane Macartney of the Reuter News Service says the Oct. 12 court decision, which was revealed just today in the Chinese media, found a major Chinese computer dealer guilty of copying software illegally.

Valerie Colbourn of Microsoft, who also is vice-president of the Business Software Alliance, told the wire service, "We hope this is a very strong precedent. We are very pleased that the court made this decision. Although we are not so pleased with how long it took."

Reuters says the Beijing Intermediate People's Court found the Ju Ren Computer Co. unlawfully duplicated and distributed Autocad, Lotus 1-2-3, Windows 3.0, Microsoft Word, WordPerfect 5.2 and other software programs. The case was filed in February 1994 by Microsoft, Autodesk Inc., and WordPerfect Application Group.

Worldwide Typeface Planned

Font publisher Bitstream Inc. has unveiled a universal typeface that it hopes will make communication easier between Internet users around the world.

The Bitstream Cyberbit Worldwide Typeface is designed to ensure the accurate, legible viewing of multilingual documents. The product incorporates the majority of the world's major language character sets. Bitstream says it will begin distributing the typeface over the World Wide Web in early 1996 at no cost.

"While we call it the World Wide Web, the predominant language used on the Net has really been English," says Jim Welch, director of emerging technologies at Bitstream. "But there is a growing number of Internet users using their own languages; and people in other countries can not effectively view these documents because they lack the typeface support on their systems. Cyberbit will change all that."

Bitstream says the initial release of Cyberbit will support all the character set needs of North and South America, Western and Eastern Europe, Scandinavia, Greece, Turkey, Russia, the Middle East, India, Thailand and

(Continued on page 12)

BYTE & SOUND

Computer - Multimedia - Karaoke - Cellular

Canon MONEY-SAVING PROMOS

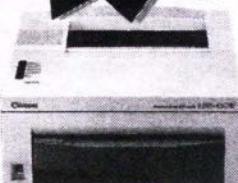
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LBP-430W Laser Printer

4 pages per minute
Microsoft-at-work Printing System
True WYSIWYG at Faster Speed
Industry First 3 year Warranty

\$569

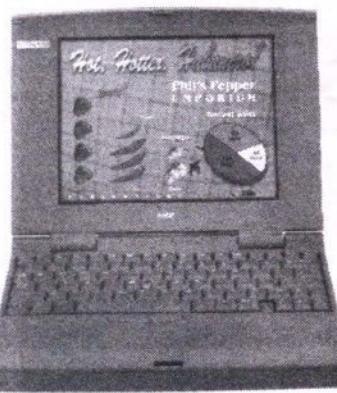
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4 pages per minute
600DPI Canon's Automatic Image Refinement Technology
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486DX4-75
4MB Ram
340MB Hard Drive

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BJ-30 Portable Bubble Jet



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BJC-4000 Color Bubble Jet

5 pages per minute
20 True Type Fonts
100 sheet automatic feeder



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Canon

BJC-70 Portable Color Bubble Jet

720 x 360 dpi
4 ppm in monochrome
360 dpi in brilliant color
30 sheet automatic feeder



\$479

Canon Innova Media System

Pentium 60mhz Processor

- * Mini-Tower Case
- * 8MB Ram
- * 1.44MB Floppy Drive
- * 540MB IDE Hard Drive
- * 1MB Video Card
- * Sony dual speed internal IDE CD-ROM Drive
- * 16 Bit Sound Card
- * 14.4bps Internal Fax & Modem
- * Canon serial mouse and mouse pad
- * Deluxe Speakers
- * Canon 101 Enhanced Keyboard
- * MS DOS 6.22 & Windows 3.11
- * Selection of CD-ROM titles
- * Pre-loaded software
- * 14" LR. NI. Color Monitor
- * 3 Years Warranty (2 year depot, 1 year on-site)

\$2,199.00

FREE
Windows 95
ask for details

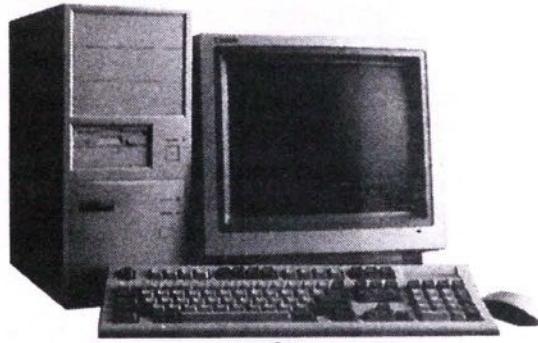
486DX2-66MHz Processor

- * Mini-Tower Case
- * 8MB Ram
- * 1.44MB Floppy Drive
- * 420MB IDE Hard Drive
- * 1MB Video Card
- * Sony dual speed internal IDE CD-ROM Drive
- * 16Bit Sound Card
- * 14.4bps Internal Fax & Modem
- * Canon serial mouse and mouse pad
- * Deluxe Speakers
- * Canon 101 Enhanced Keyboard
- * MS DOS 6.22 & Windows 3.11
- * Selection of CD-ROM titles
- * Pre-loaded software
- * 14" LR. NI. Color Monitor
- * 3 Years Warranty (2 year depot, 1 year on-site)

\$1,799.00

Prices are subject to change without notice. VISA service charge is 2.8%.

Canon

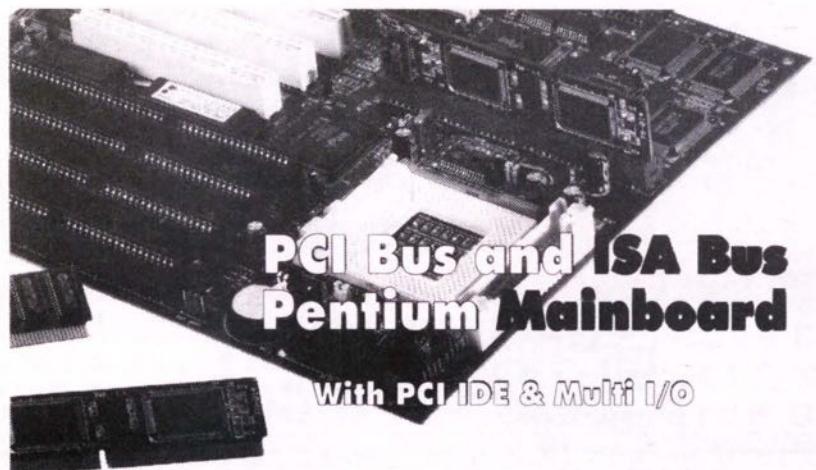


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Amptron® PM-7600 Motherboard

SPECIFICATION

CPU

Intel Triton PCIs support
Pentium 75/90/100/120/133/150/167/180/200 MHz processors
Supports Voltage Regulator Module (VRAM)

Architecture

3 PCI Local Bus slots and 4x16 bits ISA Bus slots,
All three PCI slots support Master mode.
Achieve high performance transfer rate 16.67MB/S for bus master,
PCI Bus bandwidth up to 100MB/S

Cache Memory Slot

Level 2 cache 256/512 KB Asynchronous or
256KB Pipeline burst SRAM module

System Memory

Use 72-pin SIMM modules x 4 auto banking
in multiple configuration up to 128MB,
Supports EDO mode DRAMs.

I/O SPEC

2 PCI IDE interface on board support ATA spec. up to mode 4
IDE interface- Bus master support,
Support two 16550 compatible enhanced serial port,
Floppy disk interface and
EPP/ECP high performance parallel port function

System BIOS

Support Flash ROM, Plug and Play, Green Feature,
NCR 810 SCSI BIOS



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High Resolution Monitors
Featuring 14", 15", 17", and 21"

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- Low Radiation
- Flat screen
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BEST OVERALL
GENERAL BUSINESS
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Multimedia Notebooks
486 66/100 or Pentium 75/90

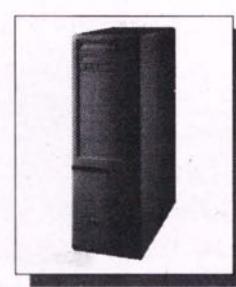
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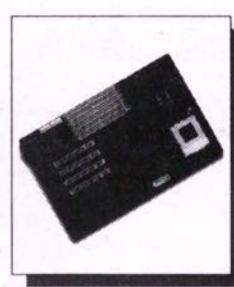
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Acer

AcerOpen Systems
Pentium & 486 Systems

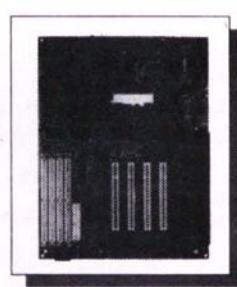
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- Consistent, Reliable Parts
- Energy Star Compliant
- Home & Multimedia PCs
- Workstations & Servers



Acer

Motherboards
Pentium & 486 Motherboards

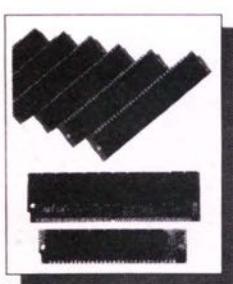
- Acer
- Leo (FIC)
- Gigabyte
- 72-pin & 30-pin SIMMs
- Energy Star Compliant



ASUS

Pentium Motherboards
System Components

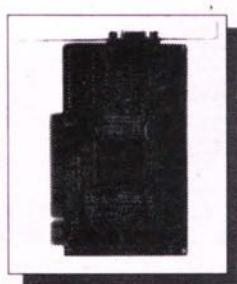
- IP54NP4 Dual Pentium
- EP54NP4 EISA Dual Pentium
- P55TP4XE, Pentium 75-133
- EDO & Pipeline Burst SRAM
- Plug 'n Play, Flash BIOS



TOSHIBA

Memory Modules
Premium Japanese & US RAM

- Toshiba
- Hitachi
- Digital
- NEC, OKI
- TexasInstruments



DIAMOND

MULTIMEDIA
Peripherals

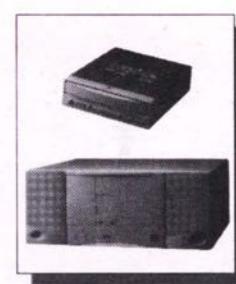
- S3, Trident, Cirrus Logic,
- ATI, Diamond Video Cards
- 14.4 & 28.8 FaxModems
- Floppy Drives & Mice
- IDE & SCSI Adaptors



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KME Cases & Power Supplies

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- Tower: 15", 19", 21"
- Sever Tower: 26" & Dual
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- 200W, 230W, 250W, 300W



CREATIVE

Multimedia

- Creative Labs
- Turtle Beach
- Sony, Panasonic, Toshiba
- CD Titles & Bundles
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Triton Station

Intel Pentium Processor with Fan (support up to 150MHz)
 GigaByte Triton chipset PCI/ISA Main Board w/256KB External Cache
 Plug & Play support, ZIF CPU Socket 7 + VRM for Future Intel CPU
 8MB-70ns Fast Page DRAM exp. to 128MB
 1.44MB Floppy Drive
 850MB Fast IDE Hard Drive (Mode 3)
 PCI Enhanced IDE Controller w/ 2x16550 Serial, 1xBi-Directional Parallel Bus Mastering (DMA) Mode (22MB/s)
 PCI ATI Xpression 64-bit Windows Accelerator with 2MB DRAM
 Sceptre 15" Non-Int. Low Rad. SVGA Monitor
 Mid-Tower Case with CSA Power Supply
 101-keys Enhanced Keyboard
 2 Year Parts & Service Warranty

EDO
MEMORY
UPGRADABLE

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|---------------|----------------|
| 75 MHz | \$1,900 |
| 90 MHz | \$2,035 |
| 100MHz | \$2,055 |
| 120MHz | \$2,185 |
| 133MHz | \$2,410 |



pentium
PROCESSOR

Triton Station Plus

Intel Pentium Processor with Fan (support up to 150MHz)
 Triton chipset PCI/ISA Main Board w/256KB Pipeline Burst Cache
 8MB-70ns EDO Performance Enhanced DRAM exp. to 128MB
 1.44MB Floppy Drive
 850MB Fast IDE Hard Drive (Mode 3)
 PCI Enhanced IDE Controller w/ 2x16550 Serial, 1xBi-Directional Parallel Bus Mastering (DMA) Mode (22MB/s)
 PCI ATI Xpression 64-bit Windows Accelerator with 2MB DRAM
 Sceptre 15" Non-Int. Low Rad. SVGA Monitor
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MEMORY
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| 75 MHz | \$1,985 |
| 90 MHz | \$2,120 |
| 100MHz | \$2,140 |
| 120MHz | \$2,270 |
| 133MHz | \$2,495 |

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4X CD Value Kit Includes 11 Software Titles
 MS CD Bundle for \$88 With Purchase of 4X CD Kit:
 Encarta 95, Works 3.0, Money 3.0, Scenes,
 Golf, Dangerous Creatures, Entertainment 4

Power Station

Features:
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 Pentium PCI/ISA Main Board
 w/256KB External Cache
 8MB-70ns Fast Page DRAM exp. to 192MB
 1.44MB Floppy Drive
 540MB Fast IDE Hard Drive (Mode 3)
 PCI Enhanced IDE Controller (Mode 3 & 4)
 PCI Trident 9440 Windows Accelerator
 with 1MB DRAM(expandable to 2MB)
 2x16550 UART Serial, 1 Bi-Directional Parallel
 14" Non-Int Low Rad. SVGA Monitor .28mm dp
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 101-keys Enhanced Keyboard
 2 Year Parts & Service Warranty

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| PENTIUM | 486 | INTEL | AMD |
|----------------|---------|---------|---------|
| 75MHz \$1,475 | DX2-66 | \$1,570 | |
| 100MHz \$1,630 | DX4-100 | \$1,665 | \$1,645 |
| 120MHz \$1,760 | DX4-120 | | \$1,678 |

Multimedia System

5X
CD ROM

Features:
 486 VESA/ISA Main Board
 P24T upgradable w/256KB External Cache
 8MB-70ns Fast Page DRAM exp. to 128MB
 1.44MB Floppy Drive
 540MB Fast IDE Hard Drive(Enhanced Mode 3)
 VESA Local Bus FDD/Enhanced IDE Controller
 VESA Cirrus Logic 5429 Windows Accelerator
 with 1MB DRAM(expandable to 2MB)
 2 Serial, 1 Parallel & 1 Game Port
 14" Non-Int Low Rad SVGA Monitor .28mm dp
 Mid-Tower Case with 230W CSA Power Supply
 101-keys Enhanced Keyboard, Speakers
 Sound Blaster 16 Card.5x Speed CD-ROM
 2 Year Parts & Service Warranty

Multimedia System

2X
CD ROM

Features:
 486 VESA/ISA Main Board
 P24T upgradable w/256KB External Cache
 4MB-70ns Fast Page DRAM exp. to 128MB
 1.44MB Floppy Drive
 540MB Fast IDE Hard Drive(Enhanced Mode 3)
 VESA Local Bus FDD/Enhanced IDE Controller
 VESA Cirrus Logic 5429 Windows Accelerator
 with 1MB DRAM(expandable to 2MB)
 2 Serial, 1 Parallel & 1 Game Port
 14" Non-Int Low Rad SVGA Monitor .28mm dp
 Mid-Tower Case with 230W CSA Power Supply
 101-keys Enhanced Keyboard, Speakers
 Sound Blaster 16 Card.2x Speed CD-ROM
 2 Year Parts & Service Warranty

Impression

PCI Bus
w/ FAST I/O &
64 BIT VIDEO
\$ 55 more

Features:
 486 VESA/ISA Main Board
 P24T upgradable w/256KB External Cache
 4MB-70ns Fast Page DRAM exp. to 128MB
 1.44MB Floppy Drive
 540MB Fast IDE Hard Drive(Enhanced Mode 3)
 VESA Local Bus FDD/Enhanced IDE Controller
 VESA Cirrus Logic 5429 Windows Accelerator
 with 1MB DRAM(expandable to 2MB)
 2 Serial, 1 Parallel & 1 Game Port
 14" Non-Int Low Rad SVGA Monitor .28mm dp
 Mini-Tower Case with CSA Power Supply
 101-keys Enhanced Keyboard
 2 Year Parts & Service Warranty

| 486 | INTEL | AMD |
|---------|---------|---------|
| DX2-66 | | \$1,065 |
| DX4-100 | \$1,160 | \$1,140 |
| DX4-120 | | \$1,173 |

Video Graphics Adaptors

| | |
|--|----------|
| ATI Mach 64 Xpression VLB/PCI w/2MB DRAM | \$230.00 |
| ATI Mach 64 WinTurbo VLB/PCI w/2MB VRAM | \$355.00 |
| ATI Mach 64 Win Turbo VLB/PCI w/4MB VRAM | \$598.00 |
| ATI Mach 64 Graphic Pro Turbo VLB/PCI w/2MB VRAM | \$449.00 |
| Diamond Stealth 64 Video PCI w/1MB DRAM | \$180.00 |
| Diamond Stealth 64 Video PCI w/2MB DRAM | \$235.00 |
| Diamond Stealth 64 Video 3200 PCI w/2MB VRAM | \$355.00 |
| Diamond Stealth 64 Video VLB/PCI w/2MB VRAM | \$465.00 |
| Diamond Stealth 64 Video VLB/PCI w/4MB VRAM | \$675.00 |
| Cirrus Logic 5429 VLB w/1MB exp. to 2MB | \$90.00 |
| Cirrus Logic 5434 PCI w/1MB exp. to 2MB | \$125.00 |
| S3-864 64-Bit PCI w/1MB exp. to 2MB | \$135.00 |
| Trident 9440 PCI w/1MB exp. to 2MB | \$90.00 |

Monitors

| | |
|---|-----------|
| Sceptre 14" NI/L/R(1024X768, .28mmDP) | \$300.00 |
| Sceptre 15" NI/L/R(1280x1024, .28mmDP) | \$465.00 |
| CompuPartner 14" NI/L/R(1024x768, .28mmDP) | \$335.00 |
| CompuPartner 17" NI/L/R(1280x1024, .28mmDP) | \$825.00 |
| ADI 4GP 15" NI/L/R(1280x1024, .28mmDP) | \$540.00 |
| ADI 5EP 17" NI/L/R(1280x1024, .28mmDP) | \$890.00 |
| Mag DX15F 15" NI/(1280X1024, .28mmDP) | \$499.00 |
| Mag DX17F 17" NI/(1280x1024, .26mmDP) | \$935.00 |
| Sony 15SF 15" NI/L/R(1280X1024, .25mmDP) | \$680.00 |
| Sony 17SF 17" NI/L/R(1280X1024, .25mmDP) | \$1295.00 |
| Sony 17SE 17" NI/L/R(1600X1280, .25mmDP) | \$1540.00 |

HD/FD Controllers

| | |
|-----------------------------------|---------|
| ISA IDE HD/FD Controller with I/O | \$19.00 |
| VLB Enhanced IDE with I/O | \$28.00 |

Keyboards & Cases

| | |
|--|----------|
| Fujitsu 4720 Enhanced 101 Keys | \$59.00 |
| Fujitsu 8720 Enhanced 101 Keys | \$30.00 |
| Mitsumi Windows 95 Keyboard | \$30.00 |
| Enhanced 101-Keys | \$23.00 |
| Microsoft Natural Keyboard | \$9.00 |
| Full Size Tower with 230W CSA Power Supply | \$120.00 |
| Mid Size Tower with 230W CSA Power Supply | \$80.00 |
| Mini Size Tower with 200W CSA Power Supply | \$60.00 |
| Desktop with 200W CSA Power Supply | \$65.00 |

Drives & Tape Backup

| | |
|---|-----------|
| 1.2MB 5.25" Floppy Drive | \$61.00 |
| 1.44MB 3.5" Floppy Drive | \$40.00 |
| Enhanced 540MB IDE Hard Drive | \$228.00 |
| Enhanced 850MB IDE Hard Drive | \$266.00 |
| Enhanced 1.2GB IDE Hard Drive | \$359.00 |
| Enhanced 1.6GB IDE Hard Drive | \$519.00 |
| Seagate 1.0GB EIDE Hard Drive 8ms | \$335.00 |
| Seagate 1.0GB SCSI-2 Hard Drive | \$490.00 |
| Seagate 2.1GB SCSI-2 Hard Drive | \$1000.00 |
| Seagate 4.2GB SCSI-2 Hard Drive | \$1425.00 |
| Seagate 9.0GB SCSI-2 Hard Drive | \$3450.00 |
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(Continued from page 8)

Japan. The initial release will be in TrueType format for Windows 95 and NT. Future releases of the typeface will include support for other platforms, other typeface formats and other languages (such as Chinese and Korean).

Lycos Passes a Milestone

Lycos Inc. reports its World Wide Web search engine (<http://www.lycos.com>) has cataloged more than 10 million sites, representing nearly 92 percent of the entire Web.

The Marlboro, Massachusetts, company says its online catalog currently covers 10.79 million Web sites. Current calculations put the number of Web pages, or Uniform Resource Locators (URLs) at 11.74 million worldwide on 103,059 Web servers. Lycos notes that Web servers are coming online at a rate of 6,000 per month, adding more than 1.1 million URLs every month.

"Our estimates of the size of the Web are conservative," says Michael L. Mauldin, Lycos' chief scientist, and developer of the Lycos spider technology at Carnegie Mellon University. "Nevertheless, with our technology we have been able to rapidly identify and catalog new Web sites at a rate that exceeds the growth rate for the Internet as a whole."

The 10 millionth Web site cataloged by Lycos deals with "Fun Insect Facts." The site, <http://ham.spa.umn.edu/kris/science.html>, is a sub-page of a home page belonging to a fourth year graduate student at the University of Minnesota, Kristine Sigsbee.

Intel to Unveil TV Technology

Chip maker Intel Corp. is set to unveil a technology that lets PC users view television at the same time as computerized information from the Internet's World Wide Web. The Wall Street Journal reports that the product, called Intercast, depends on a special circuit board and software developed by Intel that allows for the broadcast of information over the vertical blanking interval now used for close captioning.

Nintendo Sells Billionth Game

Nintendo has sold its 1 billionth video game worldwide, or the equivalent of one game for every teenager in the world, the video game giant says.

"I don't know that anyone could have envisioned the universal appeal of Nintendo's interactive video games when they were first introduced," Chairman Howard Lincoln of Nintendo of America, told United Press International at his Redmond, Wash., headquarters.

UPI adds, "Since introduction of the first Mario game in Japan in the early 80's, Nintendo has sold video games at the rate of



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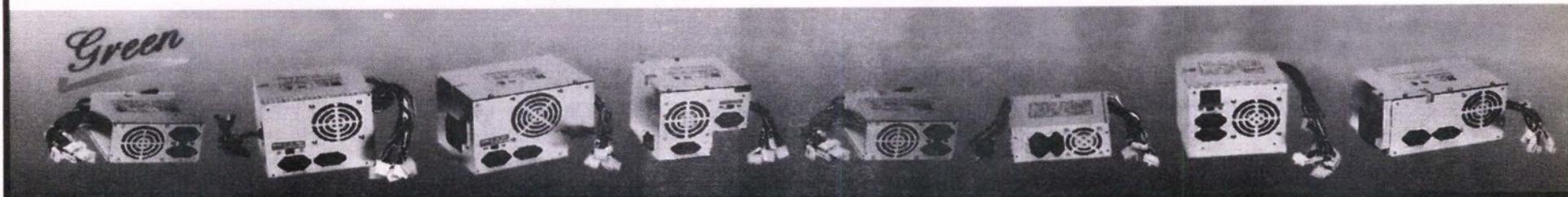
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nearly 3 per second of every day for the last 12 years... Of the 1 billion games, 50 percent were bought for the original 8-bit Nintendo Entertainment System introduced in Japan in 1983 and the United States in 1985. Some 23 percent were sold for the hand held Game Boy.

Another 27 percent were sold for the 16-bit Super Nintendo Entertainment System."

Or, divided by geography:

- 44 percent of the software cartridges were purchased in Japan.
- 42 percent in the United States and Canada.
- The other 14 percent sold around the world.

UPI says the fastest selling game was last fall's Donkey Kong Country for the Nintendo Entertainment System, which sold more than 2 million units in five weeks in the U.S. alone. But the largest selling single game was the original Super Mario Brothers cartridge for the NES, which has sold more than 40 million copies over 12 years time.

SIA: Chip Market to Grow 26% in '96

The Semiconductor Industry Association is projecting the global chip market will continue to surge next year, growing 26.4 percent to \$185.1 billion.

Reporting from San Jose, California, United Press International quotes SIA as predicting the rate of increase will cool down in 1997 with an 18.1 percent gain to \$218.6 billion and pick up slightly in 1998 with a 19.6 percent rise to \$261.5 billion.

SIA thinks growth will be strong in all geographic regions:

- The North American market will remain the world's largest and rise 29.6 percent next year to \$60.9 billion.
- Japan's market will grow 17.8 percent next year to \$47.7 billion.

• Europe will increase by 26.6 percent to \$36.2 billion.

• The Asia-Pacific region, not including Japan, should post a gain of 32.9 percent to \$40 billion.

UPI notes that the estimate for worldwide increase comes on the heels of a projected 43.7 percent gain this year to \$146.4 billion and 31.8 percent last year to \$101.8 billion.

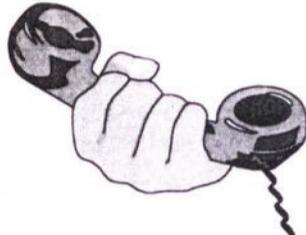
The trade group said sales of memory chips will rise 40.6 percent to \$76 billion in 1996, while microprocessors will grow 22.4 percent in 1996 to \$41.2 billion. Sales of logic chips will increase 16.8 percent to \$23.3 billion next year.

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| Netware v4.1 (5/10/25/50/100) | 1065/2425/3595/4850/6775 |
| Ethernet Hardware Kit (2cards, 2 terminators, 25' coax) | \$175 |
| Lantastic AI v6.0 Starter Kit (complete setup for 2 node) | 285 |
| Lantastic AI v6.0 Add-On Kit (complete setup for 1 node) | 155 |
| GVC NE2000 16-bit Ethernet Adapter (BNC/10BT) | \$ 65 |
| Intel EtherExpress Pro/10 Ethernet card (10BT) | 145 |
| 3Com 3C509 Etherlink IIb Ethernet Card (10BT/10B2) | 175 |
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| 3Com LinkBuilder TP/8 Unmanaged 8-port Hub | 295 |
| 3Com LinkBuilder TP/12 Unmanaged 12-port Hub | 470 |
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| Western Digital 1.6GB EIDE HD, 10ms, 64K (mode 4) | 525 |
| HP SureStore 1.2GB SCSI-2 HD, 10ms | 450 |
| HP SureStore 2.2GB SCSI-2 HD, 10ms | 1040 |
| *call for pricing on other drives | |
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| Enhanced IDE HD/FD VLB Adapter w/2S, 1P, 1G | 35 |
| Promise 2300+ VLB Enhanced IDE Card w/Bios | 85 |
| Adaptec AH-1542CF ISA SCSI-2 Controller Kit | \$375 |
| Adaptec AH-2842 VLB SCSI-2 Controller Kit | 365 |
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| USR Sportster SI 14.4 Internal Fax/Modem | \$ 79 |
| USR Woldport 14.4 PCMCIA Fax/Modem | 150 |
| NE2000 16-bit Ethernet Cards (some with manuals) | 25 |
| Colorado DJ-10 Tape Backup Drive (120MB) | 50 |
| Gateway 16-bit Ethernet Card | 50 |
| DataRace Redicard PCMCIA Ethernet Card (Coax) | 125 |
| TVM 3GL/R 14" SVGA Monitor, .28mm dp, NI | 300 |
| WinLink File Transfer Software w/Parallel Cable | 25 |
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| Colorado DJ-35 Tape Backup Drive (350MB Max.) | \$ 185 |
| Colorado Travan T1000 Tape Backup Drive (800MB Max.) | 265 |
| Colorado DJ-50 Tape Backup Drive (1.4GB Max.) | 345 |
| Colorado Trakker 350 Parallel Backup (350MB Max.) | 325 |
| HP SureStore 2/4GB Internal 4MM Dat Drive | 1155 |
| HP SureStore 4/8GB Internal 4MM Dat Drive | 1475 |
| 3M DC2120 tape cartridge 120MB capacity | \$ 20 |
| 3M DC2120XL Tapes, (350MB Max.) | 25 |
| 3M MC3000XL Tapes, (1.4GB Max.) | 45 |
| 3M DG90M 4MM DAT Tapes | 17 |
| Mini-size 13" tower or Desktop w/200W Jaba PS | \$95 |
| Mid-size 19" tower case w/200W Jaba PS | 115 |
| Full-size 25" tower case w/250W Jaba PS | 165 |
| Full-size 27" tower case w/300W PS 2 fans, wheels | 245 |

Printer & Accessories

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|--|-----------|
| Canon BJ-30 Portable Mono Inkjet Printer | \$335 |
| HP DeskJet 600 Inkjet Printer, 300dpi, 4ppm | 435 |
| HP DeskJet 660c Colour Inkjet Printer, 600dpi, 4ppm(blk) | 585 |
| HP LaserJet 5L 1MB 4ppm, 600dpi | 699 |
| HP LaserJet 5P 2MB/5MP PS, 3MB, 6ppm, 600dpi | 1275/1495 |
| HP LaserJet 4+ 2MB/4M+ PS, 6MB, 12ppm, 600dpi | 2125/2875 |
| JetRam card with 1MB for IIP/III/IIIP | \$115 |
| HP LaserJet 4/4+/4M+ toner cartridge | 155 |
| Raven RP-2405 Printer, 24pin, 192cps | \$235 |
| Raven RP-2407 Printer, 24pin, 192cps, Colour Upgradable | 295 |
| Raven RP-2420 Printer, 24pin, 256cps, Colour Upgradable | 390 |
| Raven RP-2467 Wide CarriagePrinter, 24pin, 240cps | 595 |
| Raven Color kit for RP-9105/2406/2420 printer | 75 |
| Serial kit for Raven printer RP2406/2420 | 65 |
| Printer Auto/Rotary Switchbox 2:1/4:1 | 30/50 |

CD-ROM & Others

| | |
|---|-----------------|
| Panasonic DoubleSpin CD-Rom w/interface | \$ 95 |
| Toshiba QuadSpin CD-Rom 5302b IDE/3601 SCSI-2 | 225/445 |
| SoundBlaster 16 Vibra Sound Card (OEM) | 125 |
| Multimedia Stereo Speakers, 25 Watts | 50 |
| Sony CSS-B100 Speaker Set | 135 |
| Creative Labs Multimedia Home Office 4X Kit | 565 |
| Teac 1.20MB 5.25" Floppy Drive | \$ 70 |
| Teac 1.44MB 3.5" Floppy Drive / with frame | 60/65 |
| Fujitsu KB-8720 Keyboard, 101 Key Soft-Tactile | 38 |
| Fujitsu KB-4720 Keyboard, 101 Key Click Tactile | 65 |
| MS "Natural" Keyboard, 104 Key Ergonomic | 125 |
| Focus 2001/2 Keyboard, 101 Key Enhanced | 55 |
| APC Personal SurgeArrest Strip w/Tel | 45 |
| APC Professional SurgeArrest Strip | 65 |
| APC Back-UPS 280/400/450/600VA | 145/215/250/350 |
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I-Net Standards Identified

The Information Infrastructure Standards Panel (IISP), representing more than 80 standards developing organizations, corporations, industry associations, consortia, and government agencies, has identified close to 40 standards needed to implement the information superhighway.

At a two-day meeting in Milwaukee, the IISP addressed such standards issues as security,

copyright protection, and network interconnection.

The IISP, established in 1994, is a cross-industry standards effort sponsored by the American National Standard Institute (ANSI). The IISP aims to ensure that the standards needed to deliver products and services across the national and international information infrastructures are identified and developed.

"The group comprises a broad spectrum

of participants from the private and public sectors and from all industries, with more than 25 standards organizations working to determine where existing standards meet requirements and where additional standards development efforts are required," says Oliver Smoot, the IISP's chairman.

More information about the IISP is available on the group's World Wide Web page: <http://www.ansi.org/iisp/iisp.html>.

Classical Music Comes to Web

Classical music lovers are being invited to a new Internet site on the World Wide Web to sample sound files contributed by conductor Joseph Rescigno of the Florentine Opera Company of Milwaukee.

Currently, the site (reached at Web address <http://www.concertatore.com/concertatore>) has Rescigno's excerpt from "Verismo," a CD of classical operatic selections (Analekta — AN 2 9602) featuring international diva Diana Soviero, accompanied by L'Orchestre de L'Opera de Montreal.

Besides sound files and information on the conductor and his performing schedule, the Concertatore Web site offers a discussion board where he addresses questions of a technical nature from professional and amateur musicians, scholars, and journalists.

PC Market Up 21 Percent

Industry trackers say the worldwide PC market reached 14.15 million units in the third quarter, up 21 percent from the 1994 quarter.

Dataquest Inc. researchers say that for the seventh consecutive quarter Houston-based Compaq Computer Corp. was the leader with 1.49 million. It was followed by Apple Computer Inc. with 1.28 million, IBM at 1.15 million, Packard Bell with 835,000 and NEC Corp. with 682,000.

United Press International reports Dataquest, citing strong growth in the United States and Japan and the economic recovery in Europe, predicts fourth quarter PC shipments should top 17 million.

Also Dataquest notes Apple has regained the No. 2 position for the year to date from IBM during the third quarter with its market share rising to 9 percent from 7.4 percent in the second quarter.

"On a year-to-year basis," says UPI, "Apple's third quarter represented a 20.5 percent increase, while Compaq's was up 21.6 percent. IBM gained 13.2 percent, low-end specialist Packard Bell jumped 30.5 percent and Japanese PC giant NEC was up 47.9 percent. Other PC makers shipped 8.72 million machines during the quarter for a gain of 19.9 percent."

Toshiba Has Speedy CD-ROM Drives

Toshiba America Information Systems Inc.'s disk products division has launched the XM-3701 series of 6.7-speed CD-ROM drives.

The drives support a 1,000 Kbytes per second data transfer rate and a 120ms random seek time. Jerry Higgins, a Toshiba vice president, notes that the drives offer "the performance

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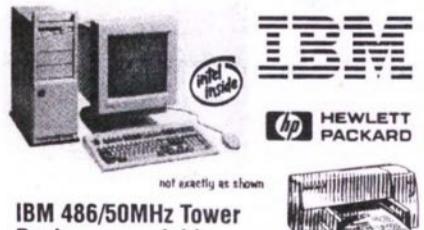
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necessary to support smooth full-motion video and complex high-end graphics transfers from CD-ROMs."

According to Toshiba, the 6.7-speed rotation is achieved through the use of enhanced error correction and a digital signal processor, as well as an improved optical pick-up head and spindle motor. The drives also support one-speed and two-speed rotations.

The XM-3701 drives employ the same variable speed playback system used in other Toshiba CD-ROM drives. The system allows the drive to read data before the disk reaches a specific rotational speed, allowing enhanced read times. Toshiba says the variable speed playback also decreases power consumption to an average 5.9 watts.

The XM-3701 drives are compatible with all major CD-ROM formats. The drives are available in internal and external models, priced at \$415 and \$515, respectively.

Maxtor Accepts Hyundai Buyout

Disk drive maker Maxtor Corp. has agreed to a \$223 million buyout from Hyundai Electronics Industries for the 63 percent of the company that the South Korean firm does not already own.

Maxtor agreed earlier this year to sell 37 percent of itself to Hyundai for \$150 million. This time, Hyundai has agreed to pay \$6.70 a share for the 33.3 million shares of Maxtor it does not own, according to United Press International in a report from San Jose, California.

McAfee Promises Net Virus Guard

With a new product called WebScan, McAfee Associates Inc. says it has come up with a way to protect Net surfers from downloading viruses on the Internet's World Wide Web.

McAfee officials told reporter Joan E. Rigdon of the Wall Street Journal that the WebScan software screens programs before they're downloaded and if it finds a virus, it warns the user not to continue.

Scheduled to ship by early next month, WebScan comes bundled with an email program and a Web browser made by Spyglass Inc., but will work with any other browser software, McAfee officials say.

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Rigdon quotes security experts as saying WebScan is the first software that prevents viruses from electronically entering a computer by identifying the bug before the download actually takes place.

"Current antivirus software simply identifies a virus after it has arrived, giving it an opportunity to do damage," the Journal adds. "The introduction of WebScan points up some little-known security holes in personal computers hooked to the Internet. Most people assume that antivirus software will alert them to viruses they download from the Internet. It will — but only when a user scans for viruses, which most people do only once a day, when they turn on the computer. Even then, the software simply identifies the virus."

Rigdon notes that existing antivirus software can be set so it checks for viruses any time a computer is ordered to do anything, but most people don't use this setting because it takes up too much memory and slows down the computer's performance.

"Also," she notes, "most people correctly think they can avoid getting viruses by not downloading anything from the Internet. But a new technology called 'server push' can lead people to unwittingly download programs simply by looking at a site on the Internet's graphical World Wide Web. ... Server push automatically sends tiny programs to a user's personal computer that allow the user to see fancier special effects."

McAfee CEO Bill Larsén told the wire service that so far, no one has figured out how to plant a virus in a server-push program, but that WebScan would halt such a virus should it become a reality.

China Signs Internet Deal

Chinese officials have signed a contract with two firms to build a network called "Chinanet" with the aim of becoming one of the world's largest Internet systems.

Reporting from Beijing, the Reuter News Service says China's Ministry of Posts and Telecommunications signed the deal with its affiliate CTC Communications Development Co. and AsiaInfo Computer Network, a U.S.-funded firm, for a nationwide network that will have 31 nodes to provide long-distance and high-speed Internet services.

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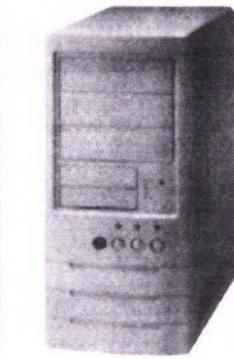
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"Chinanet will have three high-speed international links," says Reuters, "and is expected to end congestion between Chinese users and international links."

The Xinhua Chinese news service quotes a ministry official as saying the project, scheduled for completion next June, will offer automatic national roaming with a Chinese interface in addition to existing internet services and will expand access to resources from other networks.

Reuters adds that China has established five international linkages to the Internet since it officially started in May 1994.

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The custom card features a computer-enhanced photo of Gates riding a CD, flying high above the earth. Details about the card will be submitted to the publishers of the Guinness Book of Records, says Lindsay.

TI Readies High-Speed '486 CPU

While the PC market is headed toward Pentium and Pentium Pro-level microprocessors, Texas Instruments Inc. sees

potential profits in an earlier CPU technology.

TI has introduced the TI486DX4-100, a 100MHz 486DX4 microprocessor, which it says offers high-speed performance at a fraction of the price of more advanced CPUs. The chip, which is set to ship in January, will sell for less than \$70 in quantity volumes.

"Most PC buyers have a limited budget, so they must balance the performance and features they need against the price," says Rick Bergman, marketing manager of TI's PC business. "The TI486DX4-100 allows PC systems to exceed the Microsoft recommended system performance for Windows 95 by more than 250 percent."

TI sees an especially fertile market for the new chip in Third World nations, such as China, Brazil, Mexico, Indonesia, Malaysia and India, where computer technology lags a generation or two behind systems sold in the U.S., Europe and the rest of the developed world. According to market researcher International Data Corp., compound annual growth rates for PC sales in these countries are predicted to be as high as 37 percent in the People's Republic of China and 48 percent in India.

Toshiba Unveils DVD-ROM Drive

Toshiba Corp. says it has developed a prototype digital video disk-read-only memory (DVD-ROM) drive, and plans to launch a production version in late 1996.

The Reuter News Service reports that the drive is based on the standard proposed by Toshiba and six other electronics makers for DVDs, the next-generation storage technology for text, sound and images.

Taizo Nishimura, Toshiba's executive senior vice president, says the drive, which is up to nine times as fast as a conventional CD-ROM drive, is expected to replace CD-ROM drives soon.

Sun Offers New Desktops

A line of desktop workstations being promoted as including mainframe and supercomputer technology has been unveiled by Sun Microsystems Inc.

Reporting from Mountain View, California, United Press International says the Ultra family, based on Sun's long-awaited Ultrasparc chip, will start with a basic Ultra 1 at \$16,495 with three mid-range models going to \$60,000, "significantly less than similarly equipped rival machines," comments the wire service.

The new chip is a 64-bit processor with advanced graphics capabilities such as 3-D imaging without needing expensive add-in cards. It operates at speeds two to four times faster than previous Sun models sold at comparable prices.

Sega Games Come to PC CD-ROM

Sega PC, Sega of America's new computer games division, has begun shipping enhanced PC CD-ROM versions of many of the company's video game titles this month.

Comix Zone and Tomcat Alley are set to ship this week. Ecco the Dolphin is scheduled to ship prior to Thanksgiving.

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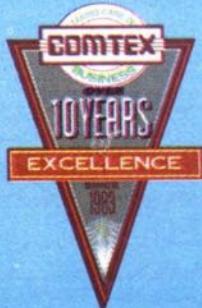
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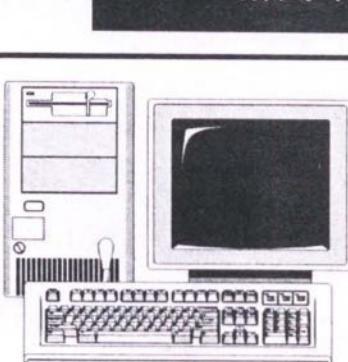


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PENTIUM Processor P100 Special

Sega PC also says its Virtual Fighter Remix game is now available in a bundle with a multimedia accelerator from Diamond Multimedia.

Sega's PC games are compatible with Pentium PCs running Windows 95.

Netscape Completes Collabra Buy

For \$185.5 million in stock, web browser publisher Netscape Communications Corp. has completed acquisition of closely held Collabra Software Inc., a producer of a groupware program that competes with Lotus Notes.

New Storage Plans Researched

High-speed holographic data storage systems holding many times the information of today's largest magnetic hard disk drives are the goal of a new research alliance by the University of Dayton's Research Institute, IBM, Stanford University and others.

In Dayton, Ohio, university officials told United Press International the potential applications are enormous, ranging from satellite communications to high-speed digital libraries.

They added that the optical storage system could hold more than 12 times the information of today's largest magnetic hard disk drives and maintain data input and output rates more than 10 times faster than now possible.

Steve Gustafson, UDRI senior research scientist and an associate professor of electro-optics, elaborated, saying, "To do that, we use

micromirrors so small that 10 of them would fit across a strand of hair. These mirrors move up and down like a trampoline and are designed to enable optical interference in the crystal that stores the data."

Gustafson notes that holographic data storage uses lasers to store information as "pages" of electronic patterns within the volume of the special optical crystal. Because a million or more data bits are placed on each page and thousands of pages can be stored in material no larger than a small coin, he said, holographic systems offer the possibility of compact devices holding trillions of bytes of information.

Also, since there are no moving parts and all the information on each page is accessed simultaneously, the technology also has the potential for very rapid access to any of the stored data at speeds more than 10 times faster than is possible today.

Big Business Halfway Into the Web

Slightly more than half of the world's 50 largest corporations — 54 percent — have established a corporate presence on the Internet's World Wide Web and are using their sites to communicate a variety of information to their key audiences, according to a review conducted by the New York office of Ketchum Public Relations Worldwide.

Ketchum reports that 27 of the world's top 50 corporations have established Web sites. Fourteen are Japanese companies, 9 sites belong to U.S. corporations, three are German, one is a British-Dutch company and one is Italian.

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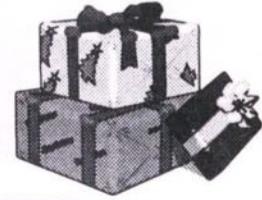
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NMB Technologies Inc., the highest volume keyboard manufacturer in the world, joined with SRS (·) Labs, a leader in audio technology, to produce the Right Touch™ Concert Master™ multimedia keyboard.

SRS's technology, Sound Retrieval System, produces a three-dimensional sound image from any audio source with just two stereo speakers. The keyboard features SRS 3-D stereo which creates a surround sound experience, and brings all sound/audio controls to the keyboard. This includes volume, mute, SRS stereo on/off, and a built-in microphone.

The ConcertMaster keyboard features: 3 side jacks for headphone, microphone and subwoofer; allows any audio device, such as external speakers, to plug into the keyboard; includes an integrated shielded speaker system with 2+2 watt amplifier; is compatible with all soundcards and portable audio devices; includes 3 new keys for Windows® 95 aware software. They are: application, left Windows, and right Windows. The application key brings up the content (pop-up) menu at the current select position. This is the equivalent of pressing the right mouse button in some applications today. Pressing the application key will not disturb the current mouse pointer position. The left Windows key sets focus to the Windows 95 user interface. The right Windows key has the same functionality as the left Windows key.

The keyboard incorporates a power slide switch which allows the user to turn on speakers or internal microphone without affecting the keyboard's functionality. It has a single cord exit for easy connection.

Supercom pulls down BC New Canadian Entrepreneur Award

Supercom, Vancouver operation, won the 1995 BC New Canadian Entrepreneur Award in the Wholesale Category. It was voted by the industry as the number one distributor of computer products in the country. Supercom earned it by providing their customers with top products, highly skilled technical support and by their ongoing efforts to understand the needs of the market. Charlton Lam, General Manager, started the Supercom Vancouver operation in 1989. The company has grown since then. In July, 1995, the company obtained its ISO 9002 Certification. Charlton is one of the founders of the Western Canada Computer Distributors Society. He is the current president of the WCCDS.

Supercom is one of the larger computer product distributors in Canada. The company distributes over 1,500 products to over 7,000 resellers across Canada. It is headquartered in Markham, Ontario. The company is currently setting up its Montreal sales office to serve the Quebec and Eastern markets of Canada.

Last December 17, 1994, Supercom was selected by the Financial Post as one of Canada's 50 Best Managed Private Companies. □

The SRS (·) differs from stereo and traditional sound expansion techniques because it is based on the human hearing system. It retrieves the spatial information from recordings and restores the original three-dimensional sound field. As a result, the reproduced sound is much closer to a live performance.

ConcertMaster is 100 percent compatible with 286 or higher processor, Novell Netware, DOS, Windows 3.x and Windows 95. NMB Technologies has



received Microsoft Compatibility Labs' approval. ConcertMaster has been approved for logo usage by Creative Labs SoundBlaster compatibility. The Right Touch ConcertMaster keyboard is available for the 1995 holiday season through Ingram Micro and Almo Distributing, and retailers nationwide. The manufacturer's SRP is \$199.95, street pricing could hover around \$139. □

For more information, contact: NMB Precision Inc. at (604) 990-0889



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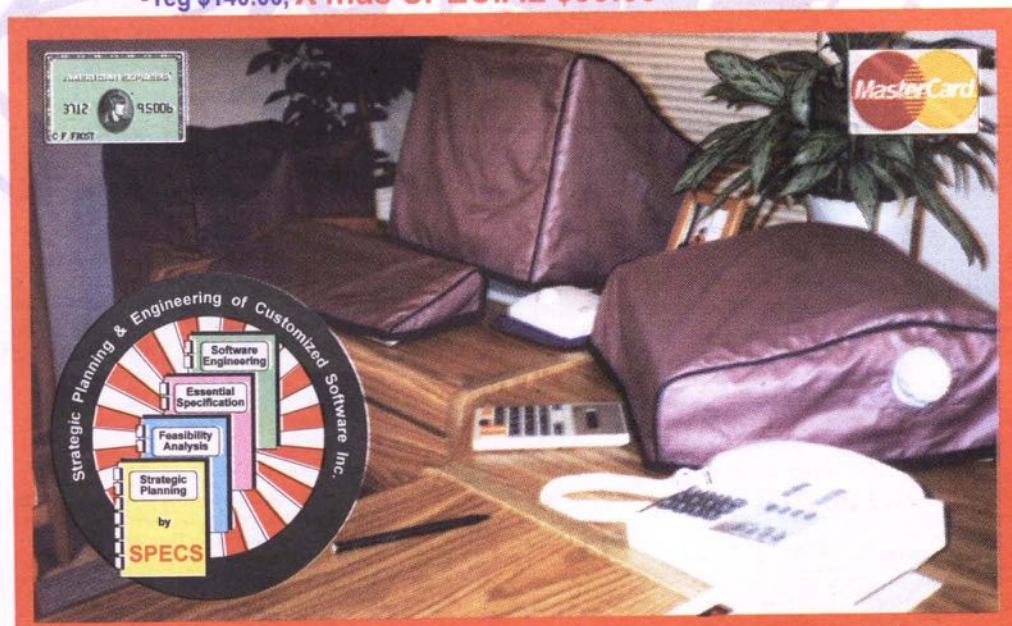
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Byte Magazine rated The Soundx Multimedia Pentium Notebook "Best Overall," stating it "excels in overall performance..... we awarded the best color-quality to Soundx."

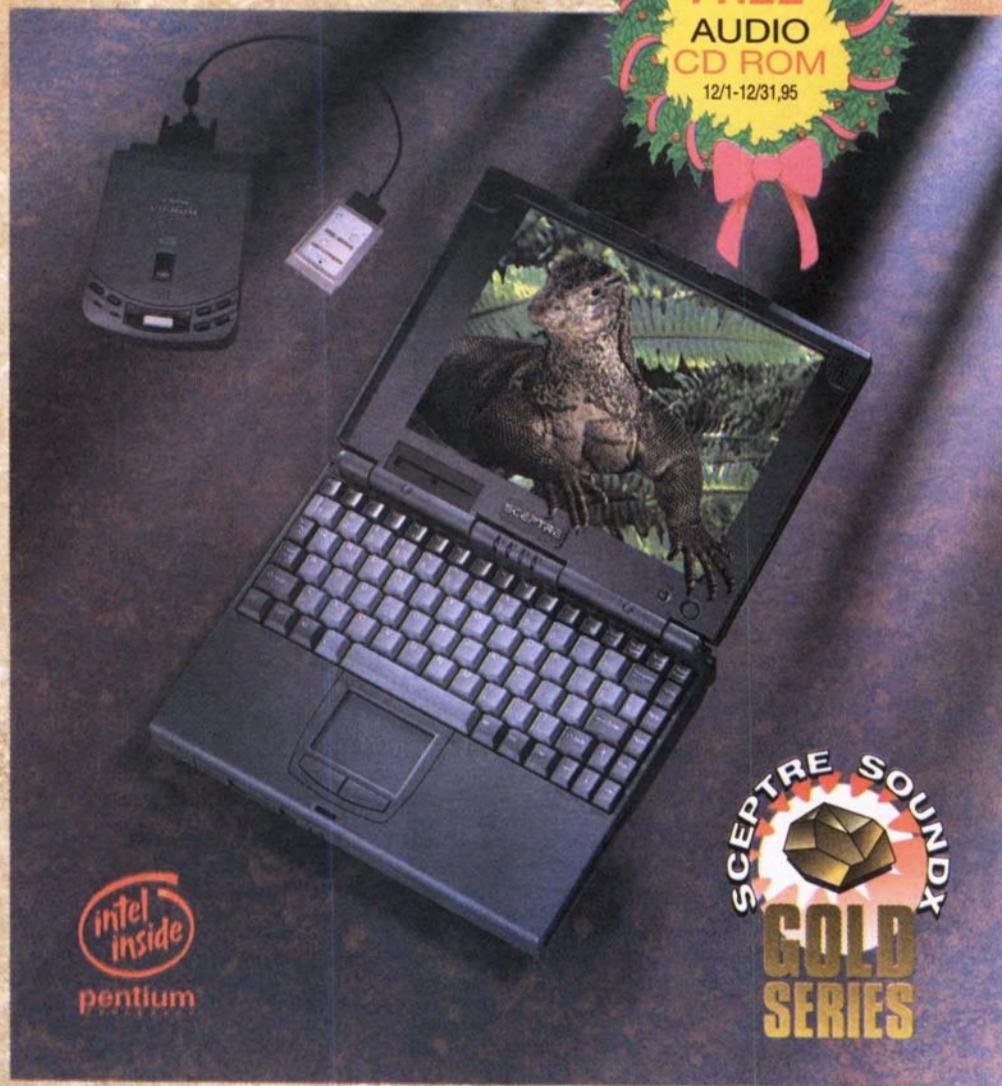
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Seagate Buyout of Conner OK'd

Antitrust regulators with the Federal Trade Commission have cleared disc-drive maker Seagate Technology Inc.'s proposed \$1.04 billion buyout of rival Conner Peripherals Inc.

Reporting from Scotts Valley, California, United Press International notes the merger, which will make Seagate the world's top producer of drives, still must be approved by stockholders of both companies and by the Commission of the European Union.

"The two companies' combined share of the booming market for drives is about 35 percent," says UPI, "and will move Seagate into the business of tape drives — used to back up disc drives — and software for managing memory in computer networks."

Apple Buys 5.1% of American Online

Apple Computer Inc. has exercised a warrant and acquired a 5.1 percent stake in America Online, paying \$12.5 million for 2 million shares of the Vienna, Virginia, online service.

Reporting for the Reuter News Service, writer Eric Auchard says some analysts think the move signals that Apple may be moving to dispense with eWorld, its own proprietary online service.

Analyst Bruce Lupatkin of Hambrecht & Quist told the wire service that eWorld, despite praise for its easy-to-navigate interface, has failed to make its mark as a broad-based online service brand.

Soundview Financial analyst John Maxwell added, "At this junction, (Apple) probably won't admit it, but eWorld isn't going anywhere."

Apple acquired the warrant, reported in a filing with the Securities and Exchange Commission, in connection with a software and licensing agreement it signed with AOL in December 1992.

Acquisition Rumors Swirl

Acquisition rumors are once again sweeping the PC industry. The latest reports have IBM Corp. making a bid for Novell Inc., and IBM and Hewlett-Packard Co. making separate offers for Apple Computer Inc.

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The Reuter News Service says IBM CEO Louis Gerstner is declining to comment on the reports. "I have no comment on rumors," Gerstner told reporters at the company's booth at the COMDEX/Fall computer industry trade show. "You know that I have no comment on speculations." Apple, HP and Novell representatives also declined to comment.

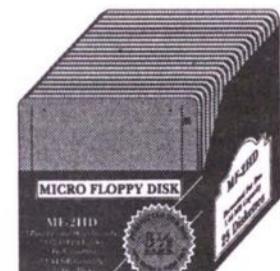
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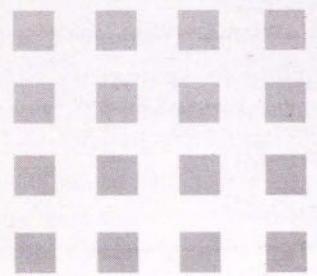
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Buying a Pentium

John A. Hosh

You want to buy a Pentium. You want to know what kind of Pentium to buy and where to buy it. I have recently become the proud owner of a Pentium. My story may help you.

First, I made a list of specifications. At the top of my list, I put Flash BIOS. The flash built-in operating system allows a user to upgrade the computer's functionality, if the manufacturer recommends it, without replacing any hardware. The user can upgrade by using the manufacturer's software. The Intel Triton chipset uses a Flash BIOS.

Next, I considered how much RAM I should buy. Microsoft says that one can run Windows 95 with 4MB, but it recommends 8MB. The Word for Windows 95 packaging says that Word needs 6MB. The packaging for Works for Windows 95 says that it can make do with 6MB but it recommends 8MB. In its manual for Word for Windows 95, Microsoft states that if one wants to use Word as an e-mail editor, then one should have at least 12MB of RAM. Configurations of 8MB and 16MB are common. Everybody says that more is better. To be certain that my computer would never dawdle in processing my commands, I added to my specification that I should be able to add RAM up to 128MB, the most common degree of expandability offered. A couple of months ago, that would have been the end of the matter, but now one must decide on the flavour of the RAM that one wants. Does one want plain, vanilla RAM or does one want the new, refreshing EDO-RAM? "Extended data out RAM" moves the computer's processing speed up one notch (Pardon the technical jargon.) from the plain RAM's processing speed. This increase in speed means, of course, that EDO-RAM costs a little more than ordinary RAM. Moreover, EDO-RAM requires that the computer have a chipset that supports EDO-RAM, and that the computer come equipped with a "pipelined burst cache." Without this special cache, the computer will not make optimum use of the EDO-RAM. The pipelined burst cache uses synchronous SRAM [good] (rather than asynchronous SRAM [bad]) to keep on hand the contents most recently used in RAM. The cache thereby speeds up the

computer's processing. The cache comes in two sizes at present: 256KB and 512KB. I read somewhere that 512KB makes sense only with a system that uses 32KB RAM or more. The pipelined burst cache is, of course, an extra cost. The two chipsets that support EDO-RAM, at the moment, are the Intel Triton and the Symphony Rossini. I specified the Intel Triton because most manufacturers are offering it.

After making my choices with regard to RAM, I considered graphics adapters, also known as graphics accelerators or video cards. The video card is responsible for the colours and presentation of the images on the screen. The card may be 32-bit, 64-bit, or 128-bit. It may use DRAM or VRAM or EDO VRAM or WRAM. Common configurations use 1MB or 2MB of RAM. Users who intend to run demanding graphics or design programs may opt for 4MB and beyond. As one moves from 32-bit to 128-bit, the price increases. As one moves from 1MB upward, the price increases. As one moves from DRAM up to WRAM, the price does not necessarily increase, but performance will. DRAM can be really slow. Not all boards allow additional video RAM to be added if the user decides later that he or she wants better performance. The newest 64-bit cards provide full-motion video, that is, they can play video at thirty frames per second, fast enough to resemble television. With additional hardware or with the appropriate software, the new 64-bit cards will play MPEG movies (on CD). The Matrox MGA Millenium (WRAM) provides built-in, 3-D, hardware acceleration. Some cards offer such features as on-the-fly resolution-switching, zoom, and the virtual desktop. I made my choice of video card with regard for the reports in the magazines and upon the assurance of my manufacturer that it would "support the card." In hindsight, I suggest that the buyer of a video card pay attention, beyond price, speed, and features, to whether Microsoft has certified the card to be Plug and Play, whether the card's manufacturer provides software that will work with Windows 95, and whether the card's manufacturer has a good reputation for service! I will say more about my suggestion later.

I settled on 2MB of VRAM or WRAM as being best for my purposes, and moved on to choose a monitor.

Monitors come in sizes 14, 15, 17, and 21. They should be non-interlaced (NI) and warranted for at least three years. They may have a dot pitch of .28, .27, .26, or .25. The .25 provides the sharpest picture, and, you guessed it, is the most expensive. The trend in monitors is toward Plug and Play: you connect the electrical cords, turn on the computer and the monitor, and everything works. With monitors, the user's principal consideration is the appearance of the screen. The screen's appearance depends, first, on its vertical refresh rate, that is, how many times per second the monitor redraws the screen. The Video Electronics Standards Association recommends a standard of no less than a 72 Hz refresh rate at any resolution. A refresh rate below 72 Hz causes the screen to flicker. The screen's appearance depends, second, on details such as brightness, contrast, alignment, and convergence. I depended on the magazines to tell me which monitors produced the best image. I was also concerned about the amount of radiation that a monitor might emit. I learned that monitors with devices to reduce radiation are rated as either MPR II or TCO, TCO being a stricter standard. Finally, I paid attention to the numerous commentators who say that a 17" monitor is the only way to go. The problem with smaller monitors is the clutter produced by the close assembly of windows, icons, taskbars, and the like that the user creates when he or she opens several applications at once. The problem with 17" and 21" monitors is their cost and their weight. They are heavy beasts!

Having decided what monitors I would consider, I put an 850MB to 1GB

hard drive on my list of specifications. I specified that the hard drive should not have a greater than 10 millisecond seek-time. Some of the less expensive drives dawdle, taking 11 and 12 ms as their seek-times. Someone who wants a computer for correspondence and a few games might find a 540MB hard drive and a slow seek-time adequate. I made my decision taking into account, first, the rule that one can never have too large a hard drive. Second, I noted that the cost of a medium capacity drive is not much greater than the cost of a smaller hard drive.

Next on my list, I put a quad-speed CD-ROM. I could have selected a double-speed CD-ROM, but the reports are that the double-speed is a tortoise. The quad-speed has good performance at a tolerable price. The sextuple-speed is fast and expensive.

To complement my CD-ROM drive, I selected a 16-bit sound card. A faster card, the 32-bit card is available, but for the budget-minded, the 16-bit card is a good performer. The user who wants to have access to the greatest wealth of software for the production of music should ensure that the sound card which he or she selects is Sound Blaster compatible. Sound Blaster is the industry's standard. If the user wants to connect a keyboard, he or she should also want to know whether the card has a MIDI interface. The speakers that retailers offer as part of their multi-media kits are apparently adequate.

Next, I put a 19" mid-tower with 230W power supply on my list. I have observed that towers come as mini, midi, and full size, and with power supplies



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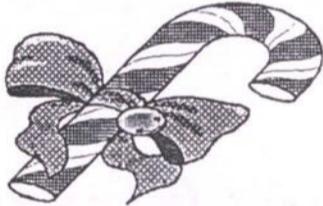
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of 200W, 230W, and 250W. Prices increase with height and wattage. Some of the computer shops told me that 200W is all one needs. I have read that the power supply becomes an issue only if the user anticipates adding both extra hard drives and other peripherals that will markedly increase the demand for power. A 200W power supply is probably adequate for most users, but someone who expects to have a lot of hardware at his or her beck and call should inquire of his or her retailer whether the power supply needs to be bigger.

Then, on my list of specifications, I made note of my need for at least a couple of years of warranty covering parts and labour, and of my need for prompt and reliable service. I might better have placed this specification at the top of my list.

Lower on my list of specifications, I made reference to features that apparently are standard on the Pentium. A 3.5", 1.44MB floppy drive is standard. The user may want to add a 5.25" floppy drive. Also standard are the EIDE PCI controller and two 16550 UART serial ports and one parallel port. To accommodate the addition of hardware, the Pentiums I have seen provide either three or four 32-bit PCI expansion-card slots.

My Pentium comes equipped with a replaceable battery with an expected life of ten years. I ordered a standard mouse with my computer, but I would strongly recommend that a prospective buyer visit one of the larger computer and electronics stores to look at the different kinds of mouse and at the other interactive devices vying for the user's dollar. Maybe the day of the standard, two-button mouse has gone!

Thus, I come to the prime specification on my list: the size of the computer in megahertz. The Pentium has, for a few months, been available in these sizes: 60 MHz, 66MHz, 75MHz, 90MHz, 100MHz, 110MHz, 120MHz, 133MHz. By the time that this issue of *Computer Player* appears, 150MHz, 166MHz, and 180 MHz sizes should be available. Overdrive chips are also reported to be in the works that will allow the buyer of the smaller sized Pentiums to boost their power. The user of a 75MHz Pentium may, for instance, be able to turn his or her machine into a 150MHz Pentium. So which Pentium did I buy? I bought the Pentium that suited my budget and my needs (both actual and anticipated). I bought the Pentium that the users of the Internet and the publishers of the computer magazines recommended. Where did I buy it?



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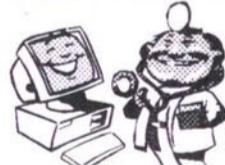
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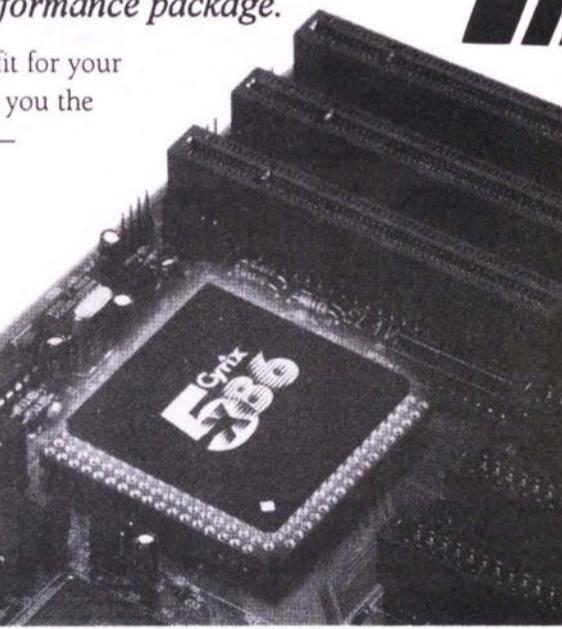


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Let me return to my story. Having described to my satisfaction the computer that I wanted, I asked myself where I might buy it. The options seemed to be five. I could buy a computer at a computer-shop, at a computer and electronics store with a service department, at a computer and electronics store without a service department, from a mail-order house, or at a super grocery store. I thought that my best bet was probably to contact those computer-shops which advertised in papers such as *Computer Player*. By using such papers, I made a list of six shops that I thought might be able to customize a system for me. I sent the shops my list of specifications and a stamped, self-addressed envelope. I asked them to send me their price with comments about my specifications. Two shops responded. (I may have written to them at a busy time, just when university and school were entering the fall

term.) One of the two shops called to inquire whether I had any questions about its response. I was impressed, but I knew that I did not have enough quotations to judge the going price for the system that I wanted. I then visited some of the shops in person and, by that means, I obtained three more quotations. Some of the shops were not willing to meet my specifications; some were too busy talk to me at the time of my visit. As a result of my visits, and as a result of some calls I made to other shops, I learned that the monitor I wanted was not easily had. One shop said that I might have to wait several weeks for that monitor. One shop said that I might have to wait for several months. Another shop said that the monitor was just not available. They all said that if I would take a less desirable monitor, they could provide me with a system in 3 to 5 days. In pursuit of that monitor, I contacted a

mail-order house. The mail-order house said that I could have a system with all my specifications within two and half to three weeks at hundreds of dollars less than I could buy a system in the lower mainland. The catch, I realized, was service. The local computer shops need to charge a premium to cover their costs of providing support for two years or so. The reason that the stores without service departments can sell systems for less than the computer-shop is that they make no provision to provide support, but support is critical for the novice user, the technically inept, and the crazy-busy! I noted that I did not fit into any of those categories, but I was reluctant to buy outside of the lower mainland because I know how readily things will go wrong with computers.

When I learned that the Pentium Pro (aka the P6) would target users who needed more power than the Pentium could provide, and that the Pro would not drastically lower the price of a Pentium soon, I made my decision. I ordered my computer. I wrote this piece with it. Right out of the box, it performed beautifully. Then I noticed that the manufacturer had enclosed some software with utilities affecting my video card. The manufacturer had also enclosed a

manual for the installation of those utilities. I installed those utilities. I should not have done that! Now, when I boot in Windows 95, the system shuts off my monitor. When I called the manufacturer, it said that the software was incompatible with Windows 95. Now it tells me! Now I will not touch anything that does not have the Windows 95 logo.

That is my story. Make of it what you will, but do yourself a favour and pay heed to the five S's: service, speed, screen, software, and service. □

About the author: **John A. Hosh** is a computer enthusiast and writer. His e-mail address is: jhosh1@freenet.vancouver.bc.ca.



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Corel PHOTO-PAINT 5.0

Swee-Sim Tan

PHOTO-PAINT'S retouching tools enable you to alter parts of the image. Some of the tools are also available as filters.

Start Corel PHOTO-PAINT and load an image. You select the retouching tools from the Toolbox. It's a good idea to save the image before experimenting with the tools. You can Undo each stroke as soon as you complete it and before you make another stroke.

Tinting

Tinting paints a glaze of colour over the image. Use it to add detail or tone down parts of the image.

Click the Tint Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size and the density of the Tint. In the Color roll-up, select a tint colour. Paint over the image with the Tint Tool.

To tint a grayscale image, click **Image**, **Convert To**, and select a colour format. Paint with the Tint Tool using colours selected from the Color roll-up.

Blending

Blending smooths edges by making colours "run." It creates shades of the adjacent colours.

Click the Blend Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size. Choose a Blend value. The higher the number, the more the colours will run. You can also drag the slider control across the scale.

Drag the Blend Tool over the image. Each pass of the tool will increase the amount of blending. Zoom in to see the effect.

Sharpening

Sharpening increases the contrast between colours by darkening the edges of dark colours, and lightening light colours. It creates outlines, producing an opposite effect to blending.

Click the Sharpen Tool in the Toolbox. In the Tool Settings roll-up, choose a small tool Size and set the Sharpen value. The higher the number the greater the contrast. You can also drag the slider control across the scale.

Drag the Sharpen Tool over the edges of colour areas in the image to create outlines.

Smearing

Smearing spreads a colour into adjacent colours.

Click the Smear Tool in the Toolbox. In the Tool Settings roll-up, choose the tool Size. Click the Edge drop-down list. Choose Soft for a feathered edge. Enter a number for Density. The higher the Density, the more the smeared colour will spread. Enter a Transparency value. The lower the Transparency value the more the smeared colour will cover other colours.

Drag the Smear Tool in the image. Start in one colour and stroke outwards from it.

Smudging

Smudging mixes colours by scattering pixels randomly.

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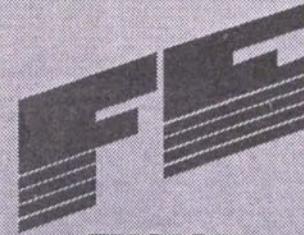
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Frequently Asked Question:

Pentium Pro (686)

*Information from Intel Corp.***What is the Pentium Pro processor?**

The Pentium Pro processor is the next generation processor family from Intel. The Pentium Pro processor includes significant architectural innovations and enhancements, like Dynamic Execution. The result is a significant boost in system performance — especially with 32-bit software. The first Pentium Pro processor is manufactured on the same silicon process as today's volume 100MHz Pentium processor.

Is the Pentium Pro processor real?

The Pentium Pro processor is very real. Technology demonstrations have been shown with the Pentium Pro processor running a variety of operating systems and applications. Systems were shown at CeBIT (an industry tradeshow) and ISSCC (a technical conference). Currently, the demonstrated system frequency has been at 133MHz.

Does software need to be recompiled to gain a performance enhancement on the Pentium Pro processor?

No. The Pentium Pro processor is designed to deliver optimal performance with 32-bit software. But you can also run the same software that you're using today and gain a performance boost. The Pentium Pro processor schedules instructions at run time

dependent upon data availability. This means that the Pentium Pro processor performs well on any code designed to run on previous generation 32-bit Intel processors. The Pentium Pro processor will also execute 286-targeted code, but the performance gain will not be as high.

While all Intel Architecture-compatible software, particularly 32-bit software, benefits from Pentium Pro processor performance, there are steps software developers can take to get full advantage of the

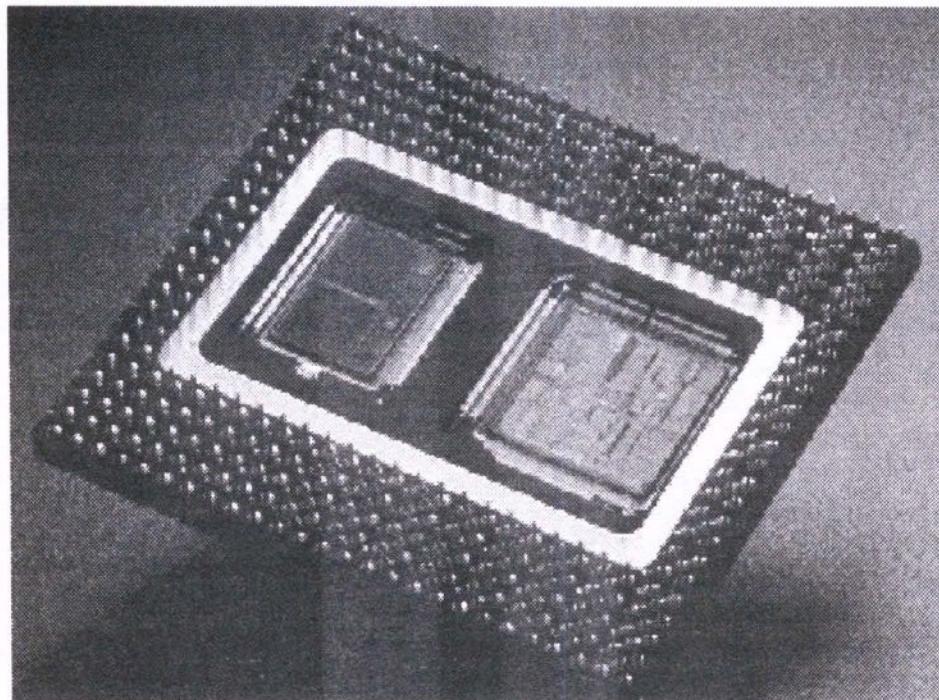
Pentium Pro processor. These include using modern compilers which can improve performance for all current Intel processors, writing 32-bit code where possible, and making their code as predictable as possible to take advantage of the Pentium Pro processor's multiple branch prediction capabilities.

Is it compatible with previous Intel Architecture processors?

Yes. The Pentium Pro processor is fully compatible with all of your existing PC applications.

How does the Pentium Pro processor achieve its performance?

Through a variety of architectural techniques such as Dynamic Execution and hardware features, such as the inclusion of the 256K L2 cache in the package.

**What is Dynamic Execution?**

It's a phrase that Intel developed to describe the Pentium Pro processor's unique combination of Multiple Branch Prediction, Dataflow Analysis, and Speculative Execution.

To implement Multiple Branch Prediction, the Pentium Pro processor contains a Branch Target Buffer which is twice as wide and twice as deep as the one implemented on the Pentium processor. The Pentium Pro processor also employs a more sophisticated, history-based prediction algorithm. For Dataflow Analysis, the Pentium Pro processor analyzes which instructions are dependent on each other's results, or data, to create an optimized schedule of instructions. Instructions are executed speculatively based on this optimized schedule, keeping all the chip's superscalar processing power busy, and boosting overall software performance. The Pentium Pro processor core also includes a retirement processor which ensures that instructions are completed in the same order as a Pentium processor would have completed the instructions.

What will Pentium Pro processor performance look like in the future?

The first Pentium Pro processor will be produced on a 0.6 micron manufacturing process. Intel are already preparing to move Pentium Pro processor production onto the newer 0.35 micron process — the same process that the new 120 and 133 MHz Pentium processors are currently produced on. This will allow the Pentium Pro processor to operate at higher frequencies.

With this change and other methods, Intel engineers are looking at ways to boost the Pentium Pro processor's frequency to over 200 MHz in the future. The Pentium Pro processor also delivers higher performance through multi-processing.

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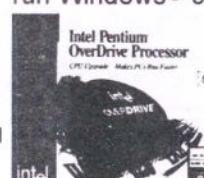
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How much will the Pentium Pro processor cost?

Intel haven't yet disclosed initial pricing.

When will Pentium Pro processor systems be available?

The Pentium Pro processor will arrive in late 1995, and Intel expect that Pentium Pro processor-based systems will be available from a variety of system manufacturers at that time.

The Pentium Pro processor looks different than other chips. Will a Pentium Pro processor fit into a Pentium processor socket?

No, the Pentium Pro processor bus is quite different from a Pentium processor bus so it is not designed to be pin compatible.

The component bus of a Pentium processor is designed to interface to an external L2 cache and includes features to optimize CPU-to-cache data transfers. In contrast, the first Pentium Pro processor includes a 256KB L2 cache in the same package and the CPU communicates with its L2 cache using a private internal bus. The component bus of a Pentium Pro processor is designed to interface to a cache coherent memory bus and includes features to optimize cache-to-memory data transfers.

The Pentium Pro processor package looks very expensive — is it?

The Pentium Pro processor is manufactured using the same silicon processing steps and the same packaging steps as today's 100MHz Pentium processor. The package does have two cavities which makes the package 40% larger than the Pentium processor package, but this is only a small cost increase in raw materials. Both die are simply wire bonded into their cavities and signals are routed between these cavities using standard pin-grid-array packaging techniques.

What about the thermal and electrical specifications? How hot will it run? At what voltage does it operate?

Power dissipation is proportional to the speed of the processor and to the square of its supply voltage. The first Pentium Pro processor operates at 133MHz with a supply voltage of 2.9 volts and dissipates a theoretical peak of 20 watts. However, power dissipation for all processors also depends on the software being executed. For more typical patterns of code, power dissipation for the Pentium Pro processor averages around 14 watts. Gunning Transceiver Logic (GTL) was chosen for the Pentium Pro processor bus signaling voltage since this is independent of processor voltage, and since its smaller voltage swing enables faster operation.

What kind of performance can I expect from the Pentium Pro processor? The Pentium Pro processor's performance is estimated at 200 SPECint92 at 133 MHz. For comparison, the 100 MHz Pentium processor will deliver 121.9 SPECint92.

Other Pentium Pro processor performance numbers will be released later this year.

What are the advantages of an in-package L2 cache?

Having the L2 cache in the package not only simplifies system design and saves space, it also means the CPU core can communicate with the L2 cache at full speed. Additionally the cache is non-blocking which means that transactions on the Pentium Pro processor bus don't stall the processor or block subsequent bus trans-

actions. For example, when a cache miss occurs, the Pentium Pro processor continues to process other instructions while initiating a bus transaction to satisfy the cache miss; these instructions could generate additional cache misses which could cause more bus transactions. The Pentium Pro processor can maintain up to four of these outstanding transactions.



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Will multi-processing be easier with the Pentium Pro processor?

The Pentium Pro processor bus was designed to support multiple Pentium Pro processors connected in parallel. The Pentium Pro processor component bus is a symmetric multiprocessing bus and includes full support for the MESI protocol. 'Glueless' MP Pentium Pro processor system designs are supported; that is, no ad-

ditional system logic is required for multi-processing since the Pentium Pro processor includes all of the logic required to directly support the interconnection of up to four Pentium Pro processors. This means that it's very easy - and cost-effective - for system designers to include multiple Pentium Pro processor processors, essentially by just providing sockets for the additional processors.

Is there a new instruction used by the Pentium Pro processor? What does it do?

A conditional move instruction was added which may be used by compiler writers as an alternate to a "test and set" construct. This allows a data dependent branch to be eliminated. The resulting code will be more predictable by the processor and will thus deliver higher performance.

What about floating-point performance?

Internal evaluation of floating-point performance is still ongoing, so Intel haven't yet released numbers.

Is the Pentium Pro processor a 64-bit processor? Does it support 64-bit integer instructions?

No. Like all Intel processors since the Intel386 processor, the Pentium Pro processor is a true 32-bit processor. The general purpose registers are the same as on previous generations of Intel Architecture processors and the instruction set is supported with only one new instruction being introduced.

However, there are a variety of wider datapaths both inside and outside the chip. One visible feature that is sometimes misinterpreted is that the Pentium Pro processor, like the Pentium processor, has an external 64-bit bus in order to communicate more efficiently with system memory. This wider external datapath increases bandwidth between the Pentium Pro processor and the system, but doesn't make the Pentium Pro processor a 64-bit machine.

The Pentium Pro processor has about 21 million transistors in total. Does this put the Pentium Pro processor at a cost disadvantage? Is it difficult to manufacture?

No. The Pentium Pro Processor CPU core has 5.5 million transistors, and the L2 cache contains 15.5 million.

The main determinant for product manufacturability and cost is the die size, which is in large part a result of the process technology that the product is manufactured on. The first Pentium Pro processor will be built on the same high-volume process as today's mainstream Pentium processors. Soon, Intel will begin manufacturing the Pentium Pro processor processor on a new 0.35 micron process which is already in use today for other products. While enabling even higher clock frequencies and higher performance, this also makes the Pentium Pro processor's die size much smaller and easier to manufacture.

The 15.5 million number for the L2 cache is also somewhat misleading. Since the L2 cache is a very regular uniform structure, the transistors may be placed more densely resulting in a relatively small die area. While the L2 cache contains nearly three times the transistor count of the CPU core, the die size is actually smaller than the Pentium Pro Processor CPU.



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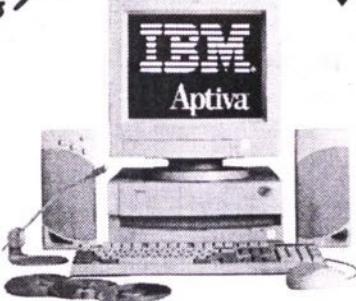
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PCs will consume at least three-fourths of DRAM demand by 1999 and reach nearly \$79 billion in revenue, forecasts Dataquest.

"Memory-hungry software applications and faster processors, coupled with a strong PC market, mean a bonanza for DRAM manufacturers," says Ron Bohn, principal industry analyst of Dataquest's semiconductor memories program. "It's a spectacular market when not only PC unit shipments rise but also DRAM megabytes per shipment go up, as we see happening in the PC memory market."

Dataquest forecasts that the current DRAM shortage will persist into 1997, which will mean high revenue growth followed by a short period of

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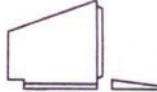
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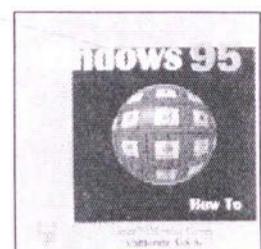
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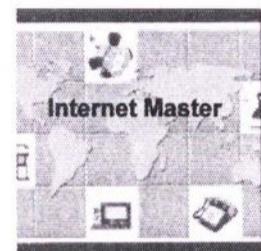
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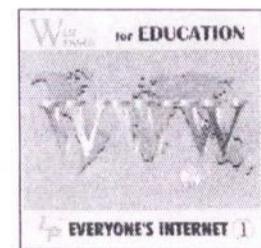


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Portables coming on strong

Mike Whitfield

The portable revolution is coming of age. No longer used as a glorified word processor or presentation device for the corporate elite, notebook computers now have mainstream applications for anyone at anytime, anywhere. It has been stated that notebook computers are not as powerful as desktop systems, when in fact, notebooks are able to compete head on in terms of speed, power, and flexibility. There are important considerations when purchasing desktops that are better represented by a notebook computer. For example, when purchasing a desktop you must consider furniture, space costs, health risks, poor working environments, and the inconvenience of location and time restraints. The notebook computer of today provides you with power, portability, and more effective expense/time management.

Most forget that with a desktop, one needs desk, a large desk since the computer covers the entire surface of most, leaving little or no space for books or other material. Keeping in mind that a desk and chair average about \$500 not to mention dedicating the necessary space for storage. Large business have already taken advantage of the cost effective solutions of notebook computers such as virtual office. The concept of the virtual office is literally an office on the go, no time or location restraints, a fully functional office that can be carried with you. By integrating wireless technology, employees can be more effective and companies can be more competitive. By implementing a virtual office environment, businesses reduce the need for expensive office space, electricity, insurance, and office furniture. IBM was able to reduce 44,000 square feet alone by providing notebooks for staff. The

advantages aren't only for company itself, the employees are able to get out of the office to see their clients allowing complete control over their time.

Consider this, most people will not sit within six feet of a television set because it may damage their eyes. Yet, these same people will sit inches away from a computer monitor that emits similar levels of radiation as a television set. Even monitors that are "environmentally friendly" emit high levels of radiation resulting in tiredness, headaches and strained eyes. Notebook computer displays, on the other hand, emit no radiation. Most quality notebook LCD displays have no flicker, are completely flat, and therefore reduce health risks associated with desktop systems. The last thing you need to worry about at home is the stress you encountered throughout your day. Another hidden cost to having a desktop system at home is not only space (den or bedroom) but the negative psychological effects of linking that stressful work environment with your quality home environment.

The portable revolution, an era in which people have full control over their time and environment. No more being a slave of the corporate world, tied to a desk and a prisoner of the office. The ideal working environment would allow for true flexibility and freedom to work when and where you like. Few companies have the vision or the insight to implement new technology, only a few companies can be a leader in their industry. The question is, do you want to be a leader? The future is notebooks, with one out of every four PCs being sold next year are estimated to be notebooks, the future has already begun.

□

About the author: *Mike Whitfield* can be reached at (800) 538-8212.

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Technical Tips and Hints

Rick McLaughlin

The CPU and Memory

All of the components in a personal computer are coordinated by a system clock. The clock generates a regular alternating signal of high and low voltages. It coordinates the various computer chips like a metronome coordinating the players in a grade school band.

The clock speed is measured in Megahertz. One Megahertz (1 MHz) is a signal that alternates between high and low values one million times a second. A 33MHz PC has a clock which "ticks" and "tocks" 33 million times each second. Each tick-tock is called a cycle.

The main board generates a master clock pulse that coordinates the CPU, memory, local bus, and support chips. If you closely examine the catalogs and ads, you will see that a single vendor may offer CPU speeds from 50 MHz up to 133 MHz, but on all systems the main board will be the same and the memory will be the same. It is possible to speed up the support chips, but useful work isn't done faster just because the clock speeds up. Two years ago, there was a brief period where most of the companies built main boards with a clock speed of 50 MHz, but everyone realized this was expensive and fairly useless. Today, the main board clock on a 486 system generally runs at 25 or 33 MHz. (There are faster boards available).

The CPU is the only chip that benefits from a higher speed. Rather than increasing the main board clock, and then putting a burden on the rest of the circuits, modern practice calls for the CPU to create its own internal clock at 2 or 3 times the main board clock. A 486 DX2 chip generally doubles the 25 MHz clock to 50 MHz, the 33 MHz clock to 66 MHz, and triples a 40MHz to a 120MHz. A 120 MHz CPU can be based



on four 33 MHz ticks, and a 133MHz... well, you can guess.

Get in Gear

To add up a column of numbers with a pocket calculator, you simply type each number in and press the "+" key (or the "=" key at the end). Most users probably think that a PC spreadsheet program does the same thing. However, the human brain has actually been doing the hard part of the operation, moving down one row in the column, focusing on the number, and recognizing it. Each PC instruction carries with it a number of additional operations that would not be obvious to the casual user.

Each generation of Intel CPU chip has performed this operation in fewer clock cycles than the previous generation.

A 386 CPU required a minimum of 6 clock ticks to add two numbers.

A 486 CPU can generally add two numbers in two clock ticks.

A Pentium CPU can add two numbers in a single clock tick.

RISC systems can run "superscalar." This means that they can perform several operations at once, and may be able to add several pairs of numbers in the same clock tick..

To make a car go faster, one steps on the accelerator. Extra gas makes the engine rotate faster. When RPM gets high enough, it is better to shift to a higher gear. The PC system clock is like the engine RPM. The CPU model selects the gear. The original 8086 processor was like first gear, and the 486 is like fourth gear. A 25 MHz 486 has the same processing power as 40 MHz 386.

Thus while the 486 may not be the best current technology, it remains adequate for most home and desktop business systems. The Pentium processor becomes attractive not because it is re-

ally needed, but because Intel is now pricing them so low that they are available at the same price as slower 486 chips. RISC systems like the PowerPC should be considered only by users who have a very clear view of exactly what programs are to be run on the machine.

Nanoseconds

All the ads and specifications quote clock speed in Megahertz. However, the more important number is the length of time between clock ticks (the cycle time). Such periods are usually measured in nanoseconds (billions of a second) abbreviated ns.

Electricity travels through a copper wire just a bit slower than the speed of light (Approx. 186000 miles per second). It becomes important when the distances are very long (astronomy) or when the times are very short (computers). A nanosecond is the amount of time that it takes light (or an electric signal) to travel about one foot.

PC clock speeds are 25, 33, 50, 66, 100, and 133 MHz. These appear at first to be a strange collection of numbers. However, the corresponding cycle types display a much more regular pattern:

| Clock | Cycle |
|--------|--------|
| 33MHz | 30 ns |
| 50MHz | 20 ns |
| 66MHz | 15 ns |
| 100MHz | 10 ns |
| 133MHz | <10 ns |

A processor with a 100 MHz clock must perform operations in less time than it takes for electricity to travel 10 feet. The chip is very small, but it has millions of circuits. All must be manufactured to a very high level of precision.

However, it is much simpler to apply quality control to a chip the size of a fingernail than to the entire main board. This by itself shows the problems of a higher speed main clock, and the benefit of capping the main board design at 25 or 33 MHz (40 to 30 light-feet of signal distance).

Memory

A computer chip receives and transfers its data through the "pins" that run along each side. A memory chip receives part of the memory address on one set of pins, then after a period of time it responds with the data at that memory location. The delay between address and data is the response time of the chip.



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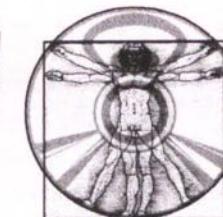
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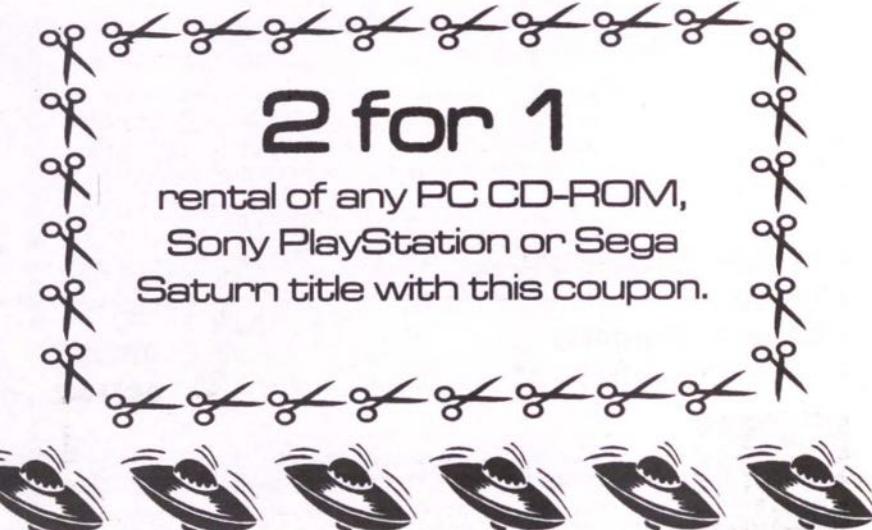
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Some chips return only one bit of data on one pin while other chips return 4 bits of data on 4 pins.

Ordinary PC memory uses Dynamic Random Access Memory or DRAM. Typically, such memory is rated to respond in 80 to 70 nanoseconds. A smaller amount of memory may be added to the system as an "external" or

"second level" cache. This is made of faster Static RAM or SRAM. External cache is nice if you get it, but it may not be worth the trouble to purchase and install it yourself.

DRAM is typically packaged on small boards called SIMMs. Each memory location holds 8 bits of data (a byte), but the memory also maintains an

extra bit to serve as a parity error check. Memory does not fail often, but when there is a problem it generally affects all the data in a chip. The parity check detects the error. The system will crash, but the diagnostic error at power up indicates which SIMM needs to be replaced. (Check the amount of RAM checked to determine which chip has failed).

There are two types of SIMMs in wide use. An older, shorter SIMM has 30 connectors that transfer information between it and the main board. This type of SIMM transfers one byte of data (plus parity) in each memory cycle. Since a 486 chip needs to transfer 4 bytes of data, the 30 pin SIMMs are installed in groups of 4. The 30 pin SIMMs are typically sold with either 4Mb or 8Mb of memory. A group of four 1M SIMMs provides Mb of memory, while a group of four Mb SIMMs provides a 16Mb upgrade.

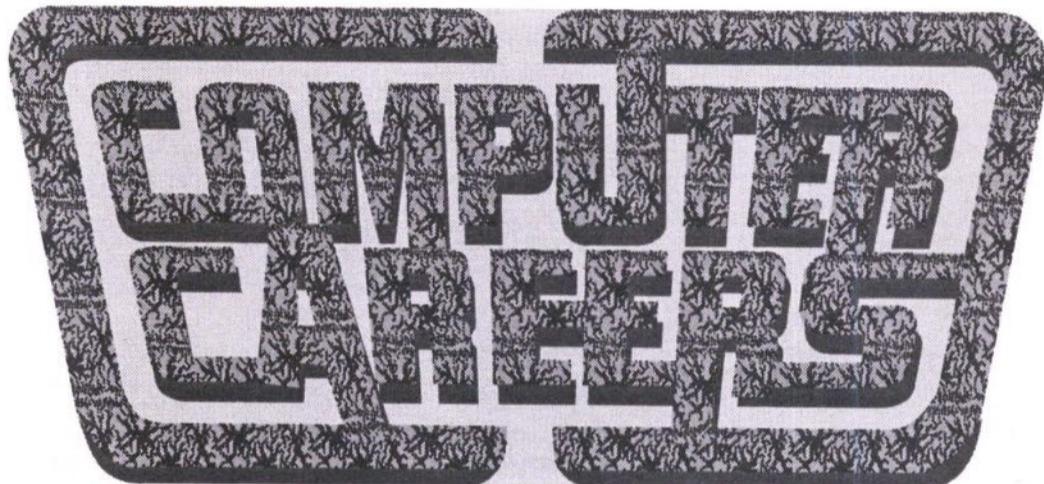
New machines today use a longer SIMM with 72 connectors. This allows the SIMM to transfer a full 4 bytes of data (plus parity) in each memory cycle. On a 486 computer, the 72 pin SIMM can be installed individually. Generally these SIMMs are sold with 4, 8, or 16Mb of memory. Some of the 72 pins indicate to the main board how much memory is on the SIMM and what speed (80, 70, 60 ns) the memory operates at. The 72 pin SIMM is becoming standard because it can be installed individually and is more foolproof.

The more powerful systems (Pentium, PowerPC, DEC Alpha) can fetch 64 bits (8 bytes) of data from memory at a time. On the high end 486 server models, the memory is "interleaved" and operates on a 64 bit bus. In either case, a high-end system may require 72 pin SIMMs installed two or four at a time. There is a new SIMM standard calling for a 168 pin configuration that supports a 64 bit data path. It is found in some models of the PowerPC but is not expected to make an impact on the marketplace for a few years yet. (Don't hold me to that!).

There are two ways to build a 1Mb SIMM using the older 30 pin technology. The SIMM has to deliver 8 bits of data and one parity bit. The simplest version uses 9 chips, each holding a megabit of data, each delivering one bit of data on demand through one pin. However, as Mb chips became more common, some vendors created a three-chip SIMM by packaging two Mb chips (each delivering 4 bits through 4 pins) and a 1Mb chip (delivering 1 bit through 1 pin). The general recommendation is to use only one type of SIMM in a system.

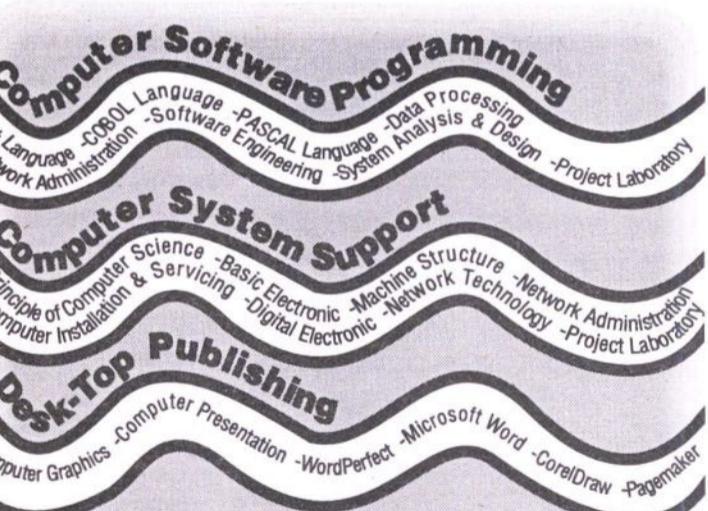
The cheapest system units and a number of the replacement motherboards have memory slots that use 30 pin SIMMs. This is becoming an obsolete technology and should be avoided where possible. The mainstream new machines from major vendors all

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use the 72 pin SIMM technology and this should be preferred.

What to do with your old 30 pin Memory

There is a 30-pin to 72-pin adapter that you can purchase to save you from having to throw away or sell your existing 30-pin memory at a substantial loss. If your dealer does not carry these, you can contact me a 604-521-6831 and I'll help you out. (Please be very careful with the type of converter that you purchase. Some of these are not very good).

Hurry Up and Wait

Data travels between the CPU and memory on parallel wires called a "bus." These wires contain the clock signal, address bits, data bits, and control signals. One of the control signals is called ready. The CPU is the fastest device on the main board of the computer. It has to be slowed down to match the memory and I/O device speed.

Every bus operation begins with a new clock tick. If the CPU needs data from memory, it places the address of the data on the bus. The 386 or 486 bus is not designed to respond in the same cycle that the address is presented. The

minimum bus operation takes two cycles. At the end of the second cycle the CPU checks the value of the ready wire. If the data was found in 25 ns SRAM cache, then ready will be active and the CPU reads the data. Otherwise, ready is inactive and the CPU waits for another clock cycle.

Each clock period that ends with the ready.wire inactive is called a wait state. No matter what the vendor says, there is no such thing as a high speed machine with 0 wait states. The processor speed is too fast and DRAM is too slow for that to be possible. Wait states are also introduced by I/O devices as they need more time to process data.

A Cold Shower

Turn on a shower first thing in the morning. The water comes out cold. The shower has to run for a minute before it gets hot. Just how long the delay depends on pipe diameter and distance the pipe is between the water heater and the bathroom.

The same problem occurs in electricity and is called capacitance. Turn on a radio, and it may take a second before any music comes out. The capacitance of a PC main board is tiny compared to

a radio, but it is significant when time is measured in nanoseconds (ns).

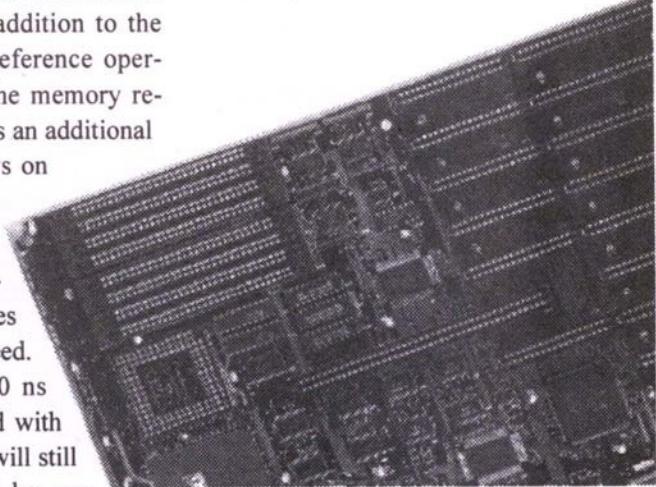
The Intel and AMD CPU chip introduces a minimum 3 ns delay between the clock tick and the time that the address reliably leaves the CPU. The main board adds several nanoseconds while the address flows through the circuits to the last memory socket. There will be a similar delay when the data value travels back from the memory chip to the CPU. The engineers who design the main board take this into account and program wait states to handle the worst case.

The engineers build a main board rated for a 33 MHz (30 ns) clock, 70 ns memory, and one wait state. Since there are two clock cycles in addition to the wait state, the memory reference operates in 3x30 or 90 ns. The memory responds in 70 ns, so there is an additional 20 ns for the signal delays on the main board.

Most main boards are designed with a specific number of wait states for a specific memory speed. A board designed for 70 ns memory can be populated with 60 ns memory instead. It will still wait 70 ns for the data (plus any

overhead for the signals to travel out and back).

Neither the memory nor the CPU know how long the main board delays will be. The water heater does not determine how long it will take for the hot water to reach the bathroom. Installing a larger water heater, or turning up the thermostat on the current heater, will not reduce the amount of time it takes to run the cold water out of the pipes. Using better memory does not change the main board design. The speed by which the CPU references memory is determined by the clock rate and the number of wait states inserted reading or writing memory.



Cache in your Chips

About thirty years ago, IBM demonstrated that a mainframe computer could run faster if it had "cachememory." The cache is a high speed memory area that keeps a copy of the most recently used data in main memory. Most programs go back and re-execute the same instructions, or update

the same numbers, and the cache provides better performance.

A modern PC has two levels of cache. The 486 family was designed with 8K of memory inside the CPU itself. This is the best type of cache, because the circuits inside the chip can operate much faster than any external data reference. When adding two numbers together, the

486 can perform the operation in two internal clock cycles (which would correspond to one external clock cycle on a DX2 that "doubles" the main board clock) provided that both numbers are already inside the CPU chip.

An external or "second level" cache can be installed with SRAM chips on the main board. SRAM runs faster than

DRAM, but it still is slower than the first level cache in the CPU. The Add operation requires two internal clock cycles, and two additional external clock cycles if the data is in the second level cache.

Because it is relatively expensive for the CPU to set up an external memory reference, and because there is a high probability that the next number or instruction needed by the program will be the one immediately following the last number or instruction, the 486 is designed to fetch data from memory in a "burst". The internal cache is arranged in units of 16 bytes. Each unit is called a "line" of cache. Whenever an instruction references data that is not in the internal cache, the chip generates a memory reference for the four bytes of needed data, and then fetches the remaining 12 bytes of a 16 byte memory area.

When data is found in the SRAM second level cache, there is one external memory cycle to set up the transfer, then the four bytes needed for the current instruction come in on the second external clock cycle, and the remaining twelve bytes come in the next three clock ticks. After five main board cycles, all 16 bytes have been moved into the chip. Without the burst, an old 386 would have used eight clock ticks to fetch the same data, since each individual four byte unit would have required one cycle to set up the transfer and one cycle to receive the data.

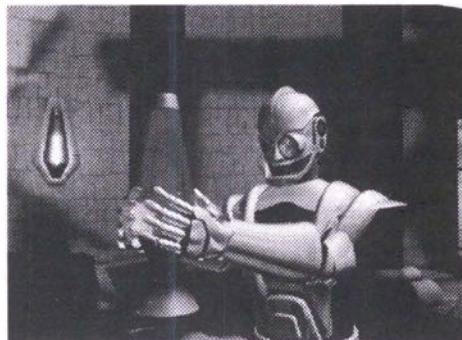
If the data is not in the SRAM second level cache, then it must be fetched from ordinary DRAM memory. DRAM typically requires at least 70 ns for each response, and this is two or three external clock cycles. So fetching the data from DRAM involves "wait" states where the CPU has to stop and wait for the memory to respond.

Interleave

In the same period that processor cycle time has dropped from 100 to 20 ns, memory speed has only dropped from 100 to 50 ns. With a 10 ns processor cycle time possible, memory response becomes a problem. Mainframe designers addressed this problem twenty-five years ago by "interleaving" memory.

A 486 chip has 32 data pins. It references memory four bytes at a time. Most main boards simply connect the CPU pins directly to the memory sockets. But the main board can achieve higher performance if it creates a wider path to memory. Interleaved memory has two sets of sockets and two 32-bit

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New Heights for On-screen Gambling

— Review of *Celebrity Poker*

David Anderson

Card games on the computer can be very addictive. I remember getting wrapped up in a simple Blackjack game on an Apple IIe many years ago. The fascinating thing about virtual gambling is the way the computer program can actually teach you how to play a card game. Since the money means nothing, you can do things you would never do in real life.



Celebrity Poker invites you to join a friendly game of poker with three Hollywood personalities. Jonathan Frakes, Joe Piscopo, and Morgan Fairchild are bright, perky, engaging, and full of encouragement as they welcome you to their card table. There is even a menu command that compels Joe Piscopo to tell jokes, if you need some instant humor during the game. If you just sit there, they will start to needle you to play. There is a limit to their patience, even though they are only video images. They do have other things to do, it seems.

Celebrity Poker contains a rotating list of common poker games. You can choose the game you like to play, or let the dealer choose his or her favorite. You have chips to ante and to bet with, and your cards appear in front of you at the bottom of the screen. The game controls are very intuitive, and the manual is only required if you need help understanding the various high-card and low-card versions of poker. The single games are designed to prepare you for a poker tournament, in which your results are totalled for a series of poker games, with big winnings for tournament champions.



Product information:
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About the author: *David Anderson* is Vancouver elementary teacher, parent of two children. He can be reached by email: computer_player@mindlink.bc.ca

Technically, this CD-ROM was a pleasure to use. It snuck through my poor old 486 DX33, and told me to use the low-grade video option, because of my slow IDE bus and my ancient Panasonic double-speed CD-ROM drive. But even with slow equipment, the game played flawlessly. I did not get to see the higher-

performance options, called "simultaneous video". On my machine, Morgan, Joe, and Jonathan took turns talking and moving. This was sufficient, however, to enjoy the action, and participate fully. When

I cranked up the game settings, the video action left trails all across the screen, so I didn't force the issue any further. As someone once said, you get what you get.

The nice thing about this CD-ROM is the way the video and sound does not get in the way of the main activity, which is betting, bluffing, raising, calling, and winning. It makes a perfect gift for any poker-playing CD-ROM user on your list. In spite of the rather lightweight Hollywood personalities, the game plays very well, teaches a ton about poker, and lets you spend endless amounts of money trying to be the best poker player around.

A great program for a rainy night! □

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Database Developments

John Hamm

Several readers have suggested that we take a look at some of the "Easy to Use" databases. Databases that you don't have to be a programmer to use.

There are several products competing for market share in this niche. **Lotus Approach**, **Alpha Five** and **Claris FileMaker Pro** are three of the leaders. In this issue we will take a look at **FileMaker Pro 2.1** - it's so easy you don't even have to read the manual.

FileMaker Pro

FileMaker was one of the first database products designed specifically for the Macintosh. After several successful years in the Macintosh world Claris Corporation introduced a PC product nearly identical to the Mac version. This Macintosh heritage is apparent in the user-interface and we are looking forward to the Windows 95 version which should bring the look and feel closer to the Windows standard.

Ease of Use

Navigation through the file is accomplished by clicking on an icon in the upper left corner representing a book. The top page of the book represents the previous record while the bottom represents the next. A "bookmark" sticks out from the right of the icon. If you drag this bookmark up or down you can quickly move through your data file even if there are thousands of entries.

Fields - such as name, address and phone number - are quickly and easily set up by simply choosing "Define

Fields..." from the "Select" menu. You type the name of your field and click one of the seven data types. The data types are text, number, date, time, picture or sound, calculation and summary. No knowledge of special numeric types is required.

Once you have defined your fields another click on the "Select" menu allows you to choose "Layout". Various tools allow you to design one or more forms with which to enter or display your information.

Pop-up menus, checkboxes and buttons can be added to your form to aid data entry. A full suite of drawing tools enables you to add design and colour.

Finding a specific record is also easy to do. Choose "Find" from the "Select" menu. A blank version of your form is presented on the screen. Simply type in the information you are looking for and click the [Find] button. For instance, if you type a phone number in the Phone field and click [Find] your form will almost instantly be filled with all the information you have entered about the person or company at that number.

You can limit your records to a smaller set, such as only companies from Seattle, by typing "Seattle" in the City field and clicking [Find]. Now

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Mailing Labels

Mailing labels are a snap to produce with FileMaker Pro.

In Layout mode you select "New Layout..." from the "Edit" menu. Here you are presented with a dialog box containing several options including Labels. When you click the Labels radio button the Label Setup dialog box is displayed. Here you can choose from a list of more than 50 standard Avery label sizes to find the exact size and shape of label you prefer.

Next a field list appears from which you select the fields you wish to appear on your labels.

When field selection is complete a click of the "OK" button lands you in layout mode again. This time a representation of your label is on the screen. You may move fields around and add decorative touches just as you would when creating a data entry form.

When you are satisfied with the appearance of your labels simply choose File/Print...

Ready-to-Run Applications

FileMaker Pro 2.1 Deluxe ships with over 20 ready-to-run applications. Some of these pre-designed solutions include:

A *Contact Manager* to keep track of existing and prospective clients.

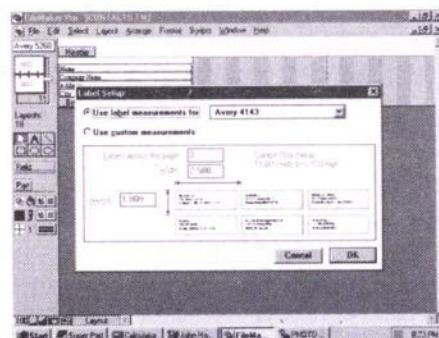
A *Lead Tracking Manager* which shares files with the Contact Manager. This allows you to follow up on all your calls.

The *Expense Manager* organizes and tracks all your expenses. You may not spend any less but you'll know where all the money's gone!

The *Invoice System* allows you to track sales while producing professional-looking invoices.

Some of the other ready-to-run applications are:

- Project Manager
- To Do List
- Home Budgets
- Personnel Records
- Job Search Database
- Buy vs. Lease Analysis
- Asset Management
- Employee Leave Form
- Job Application Form
- Home Inventory
- Party/Wedding Planner



These applications are easy to modify to suit your own particular needs and provide excellent examples and ideas you can use to produce your own professional-looking forms and applications.

Cross-Platform Issues

FileMaker Pro is exceptionally well-suited to offices which have both Macs and PC's. Mac users needing to use a PC will feel at home with FileMaker and will pick up some of the quirks of the Windows world.

FileMaker Pro imports and exports dBASE, Lotus, Paradox, ASCII text files and several other file formats. This is handy when a FileMaker user wants to work with data created by another database application, perhaps to create a mailing list or a summary report. Unfortunately, live FileMaker data cannot be shared by other database products. Changes made to a record in FileMaker are not reflected in the original data file.

FileMaker data files may be shared across a network with other FileMaker Pro users using either PC's or Macs.

The ability to share data between a Mac and a PC using a common interface is significant in a mixed-platform environment.

Requirements

Minimum requirements are a 286-based processor (386SX or greater recommended), three megabytes of RAM (4MB recommended), Microsoft Windows 3.0 or higher, a VGA video adapter, a hard disk and one floppy drive.

Conclusion

FileMaker Pro 2.1 is an easy-to-use database manager ideally suited to home or home-office work. It greatly simplifies the process of collecting, finding and displaying information.

Since this current version of FileMaker will run quite well on a 386 with 4 megs of RAM it is a good choice for users who are not planning on upgrading their hardware in the near future. □

About the author: John Hamm is a consultant and database application developer at Eastside DataGraphics, Tel: (604) 255-9559, email: John_Hamm@MindLink.bc.ca

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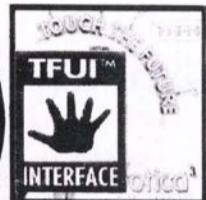
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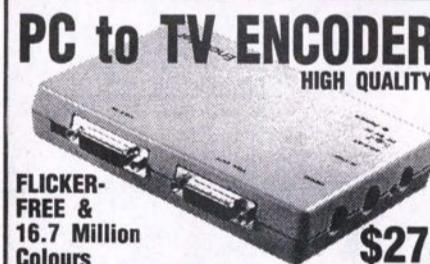
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Please put up your hands if you ever fantasized playing loud electric guitar in a rock band. Perhaps played air guitar riffs when you thought no one was looking.

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For about \$100, you get the Virtual Guitar itself, and the software—a CD-ROM game, "Welcome to West Feedback". Two other CD disks are available, to use with the Virtual Guitar.



The guitar itself is a flashy, purple electric guitar... about 7/8 the size of a real guitar, with a solid feel. Unlike a real guitar, there are no frets, and only a single string, strung back and forth to create the illusion of six strings... you see, you don't actually play notes. And that's why you need no musical background. Instead, you use it to strum along with pre-recorded music on the CD... trying to hit the strings when you're supposed to, as a good rhythm guitar player. You don't have to know when—you'll see on screen when you're supposed to play, and will get immediate on-screen feedback to see how you're doing. Like any good guitarist, though, you can use electronic effects... the guitar has built-in volume, distortion, and feedback controls... as well, you can control your screen's mouse cursor, right from the guitar. Since it plugs into your serial port, it's easy to attach and doesn't require opening up your computer or adding a card.

The system requires a 4 meg 486 with a CD-ROM and sound card, and an available serial port, running Windows and takes about 10 megs on your hard drive. Mac and Sega-CD versions are expected shortly.

Any air guitar player will find this one a lot of fun... every one I know has wanted to take a turn playing it. □

About the author: Alan Zisman is a teacher and an associate editor of Computer Player, he can be reached at e-mail at alan_zisman@computer-player.com

GAMES FOR YOUR CHRISTMAS STOCKING

Matthew Durand

In the 1st Degree

Publisher: Broderbund Software

San Francisco, hometown of Dirty Harry and The Grateful Dead, is a city with a pretty decent murder rate. It is the perfect setting for Broderbund's first entertainment release since *Myst*. The game puts you, state prosecutor Sterling Granger, to the task of putting a killer behind bars.

In the 1st is a full-motion video extravaganza, what the public likes to call "interactive entertainment." I like to call it, "Interactive Matlock" and it is almost as boring as the Mayberry lawyer himself.

This isn't a game, it's a product made for a new type of computer user, one that thinks "multimedia" and "cruisin' the 'net" are cool but playing actual entertaining computer games is for computer nerds. This game is best left non-interactive.

The video's smooth, the sound is sweet, but the poor design leaves me pulling my hair out. This game is decided by conversation choices and to win you have to make the right choices. Sounds simple but sometimes, seemingly

innocent choices end up making your witnesses storm out of the room in an uncooperative fury. Sometimes the choices seem so poor that no one but the designers would pick them, but these answers produce better results. Another problem with this game is it's really short, and the game must be played through 2-3 times just to figure out all the right questions to ask to obtain a guilty verdict. The problem is it's the same story each time and it gets boring really fast.

The verdict is, if you've got money to burn don't let me discourage you from buying this game, but for most people the price tag's too much for this title unworthy of the Broderbund label. (I wonder if they've ever heard of replay value)...

Star Trek the Next Generation: A Final Unity

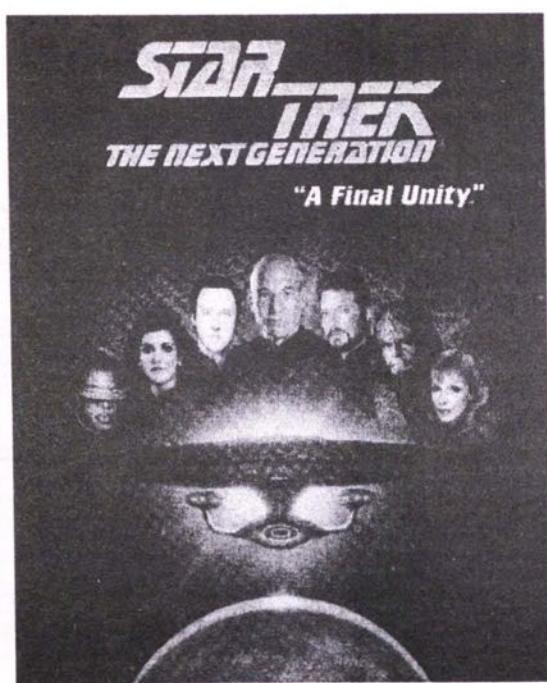
Publisher: Spectrum Holobyte

"....Its mission, to boldly go where no game has gone before....", a decent goal but the quest for the perfect adventure game doesn't end here, unfortunately.

A Final Unity is Spectrum Holobyte's first venture into the adventure game genre. And they've really gone all the way with this product, it has all the SVGA graphics and digital sound any cold blooded Romulan could wish for. All of the major characters from the television show have lent their efforts, and have actually given some pretty decent performances. It accurately conjures up all of the details of the "trekkie" universe, right down to the starbase on Kevlon 5. The most important thing though is that the gameplay is there.

Your goal: to locate the dreaded Unity Device, an ancient weapon of a derelict race with

(Continued on page 57)



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Information

Product: Name-IT

Publisher: Vertisoft
4 Embarcadero Center, Suite 3470
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803-295-5875/803-269-4719 (fax)
List price: \$29 (US)

Product: Quick View Plus

Publisher: Inso Corporation
401 North Wabash, Suite 600
Chicago, IL 60611 USA
312-329-0700/312-670-0820 (fax)
List price: approx. \$50 (US)

Product: Arcada Backup-95

Publisher: Arcada Software Inc.
708 Fiero Commerce Park, Suite 5
San Luis Obispo, CA 93401 USA
805-782-4400/805-544-9209 (fax)
List price: \$99 (US)

standard of 8-letter file names (with no spaces, please). It allows for file names as long as 256 characters (even the Mac only allows 32 characters)—I've seen student "essays" that were shorter than that.

Unfortunately, this is only supported with new, 32-bit, Win95 compatible software. Your existing Windows programs are still only aware of the old, 8 letter version... and so a word processor file named "Letter to the Editor about Taxes" will appear as LETTER~1.DOC if you're using last year's Word 6.0.

Alan Zisman

Windows 95 is a big step forward in features and usability over the various versions of Windows 3.1 that have pretty much defined personal computing for the first half of the '90s. It has a friendlier interface, long file names, more-or-less plug and play hardware support, and is more powerful and less crashable than its predecessor. (Or as cynics are saying "Windows 95 sucks less").

Its interface is good enough that it's taken most of the steam out of the formerly thriving industry creating software to enhance Win 3's anemic Program Manager. Symantec Software, for example, is targeting its Win95-compatible Norton Navigator as something to 'enhance' Windows 95's features, rather than to replace Windows features, as it did with the Windows 3 Norton and PC Tool's Desktop programs.

Better as Windows 95 is, there remains room for enhancements, and a number of companies are producing products to fill in some of Windows 95's missing pieces.

Vertisoft's Name-IT

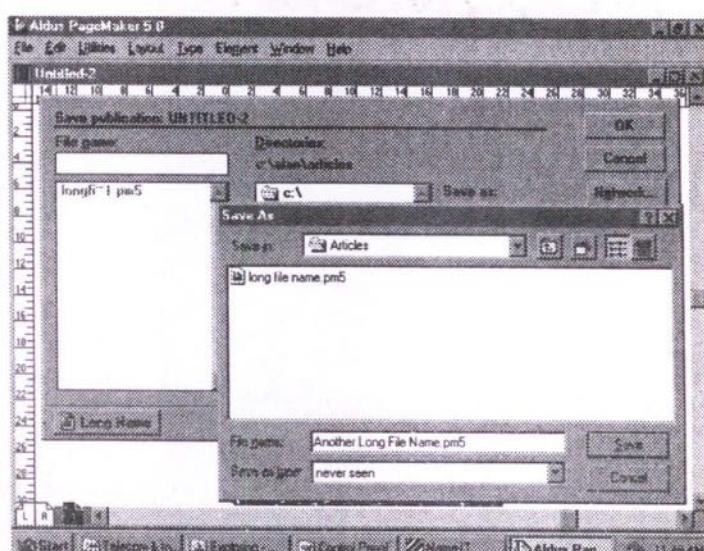
Take long file names, for instance.

Windows 95 finally breaks with the 1981 DOS

Symantec Norton Navigator includes a feature allowing old Windows programs to use long file names—but it only works with programs using Windows long file names, and a few others. It doesn't support the popular Microsoft Office programs, for example.

Vertisoft's Name-IT is a simple program that does this single thing—but does it well. When running, it adds long file name support to virtually all old Windows programs. If the programs use the Windows 3 common dialogue boxes for Open and Save As, it replaces them with their Windows 95 equivalents, complete with long file support. If your program uses custom dialogue boxes for these functions, it adds a "Long File Name" button onto the dialogue box—pressing that opens the Windows 95 dialogue, again allowing long names.

It worked with all the old software on my system—allowing me to use this useful (and long overdue) Win95 feature, without having to update all my software to new versions. (Note how-



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ever, that this will NOT allow you to safely use older utilities such as defragmenters/ optimizers or backup programs, without risking damage to the long file name structures). My only wish is that the program could be run needing its icon taking up valuable TaskBar real estate.

Quick View Plus

One of the new skills for Win95 user's is to right-click on everything... New computer users may find this easier than upgraders from Windows 3, for whom the right mouse button often seemed as little used as an appendix.

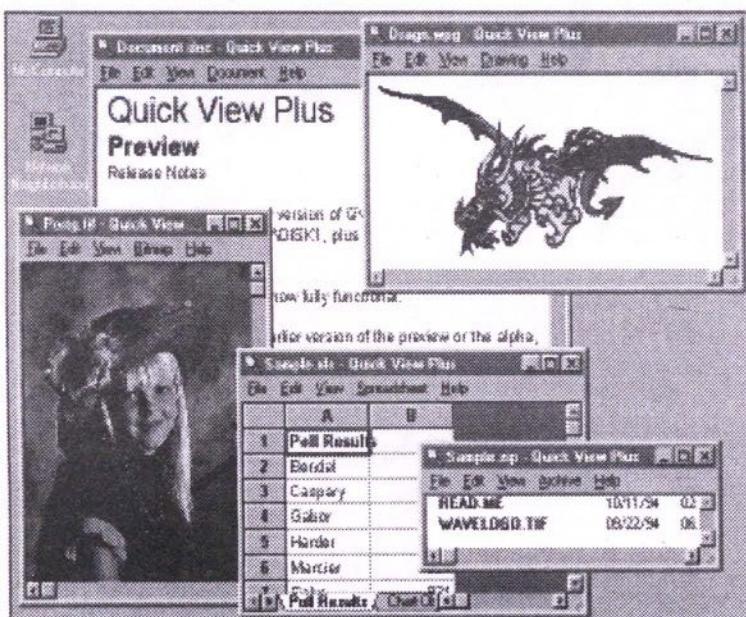
Right-clicking most things brings up a pop-up menu, with items customized to the selected object. Right-click on some data files in Explorer (or My Computer), and one of the menu items says "Quick View". Choosing this brings up a handy view of the contents of the file, without needing to waste time bringing up the application that made the file. This is especially handy if you don't actually own the application that created the file, or if you want to check a bunch of documents to see if they're deletable. (If you installed Win 95 from floppies, Quick View wasn't installed—it's on the CD version only).

Symantec thought highly enough of this feature, that even though it's previous Win 3 products, like PC Tools File Manager, included a comprehensive set of document viewers, it relies on Win95's Quick View to provide the same feature in the new Norton Navigator.

The only problem is that Quick View only provides viewers for a handful of file formats.

Inso Corporation, who actually provided Quick View to Microsoft, in the past has been known for the excellent Outside-In utility, which provides a huge range of file converters. They are marketing a replacement for Quick View, called (surprise!) Quick View Plus.

Instead of the 30 viewers included with Win95, QV-Plus lets you view over



200 document formats—virtually all of the common DOS and Windows word processing, spreadsheet, database, and graphics formats, and even several of the more common Mac formats.

Replacing Quick View in the right-click menu, QV Plus does a good job of showing fonts, line spacing, even, in many cases, embedded graphics. It will even let you view the contents of compressed ZIP files.

It can be used with e-mail in Microsoft Exchange—e-mail that now can contain graphics or other binary attachments. Or it can be used together with the Start Menu's FIND command... either to find a file, or even to find a file containing a particular text string. Once you've viewed the file, if you want, you can print, directly from the Quick View Plus window—even if you don't have the original application that created the file. If your viewed file contains an OLE object's icon, that too can be viewed.

Graphics files can be cropped or resized, and the clipboard can be used to copy and paste all or part of a document into a Windows application. Individual files within a ZIP archive can be viewed, copied, or moved—all without opening the archive.

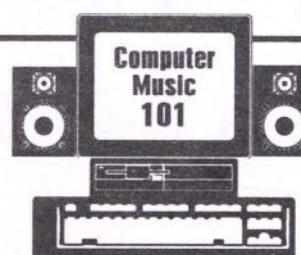
Get used to right-clicking—it's one of Windows 95's handiest features. And if you find the range of viewers that ship with Windows 95 limiting, take a look at Quick View Plus.

Arcade Backup

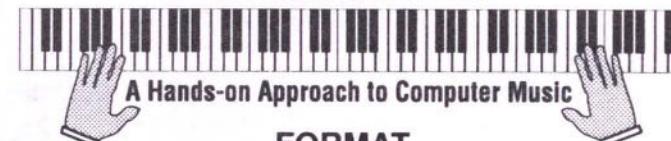
One of the big areas of complaint from Win95 upgraders has been backup. Hopefully, we all know about the importance of maintaining current backups for protection against viruses, power failures, theft, and other computer disasters.

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Older backup programs, like other disk utilities, however, are incompatible with Windows 95's long file name structure. Win95 includes usable alternatives for other disk utilities—ScanDisk and DeFrag both work well, and should be used in place of older DOS or Windows equivalents.

There is a backup program included with Windows 95, as well, but it seems like the weakest of the bunch—written by tape drive manufacturer, Colorado, it provides support for some Colorado drive models, but does not support most of the wide range of tape backup units available. No SCSI support for example. (Of course there's no support for floppy backups... in the era of common 500 meg-1 gig hard drives I shudder to think of the number of floppy disks needed for a backup).

Arcada are backup specialists. Their earlier products have been licensed to other utilities companies, appearing under well-regarded names such as Norton Backup. Under their own name, they have marketed higher-end products aimed at network managers, and alternative operating systems such as NT.

Arcada Backup for Windows 95 claims to support all tape drives commercially available today... the wide range of DC2000 (QIC 80) tapes, the new high-capacity Travan tapes, SCSI tapes, parallel port units, and more. It uses Win95's multi-tasking and multi-threading abilities to speed up backup, even while the computer is being used for other tasks.

An included Backup Wizard walks the user through the setup, allowing customization. Backups can be automated, allowing them to take place late at night, for example. As a true Win95 program, it safely supports the long file name structures. As well, special thought has gone into dealing with the Windows 95 System Registry.

The Registry is the central repository for data about the hardware, software, and users on a particular machine. It can pose problems with backup and restore processes... if new hardware or software has been added since backing up, restoring the backup could result in a loss of the new settings.

Arcada-95 handles this by treating the Registry files differently than other data files—these aren't simply restored, instead, they are compared, line by line, with the existing file—minimizing potential danger. Specific choices can be saved, allowing users to save a set of parameters for a minimal daily backup,

and a more comprehensive weekly backup, for example.

This program is a must for anyone who values their data or their computer's setup under Windows 95.

Power Toys— the Freebie from Microsoft

Not to be left out, even Microsoft is enhancing the basic Win95 product. We've previously reviewed Microsoft Plus!—the \$49 add-in. But a number of the Windows 95 interface programmers have been working, on their own time, and created a collection of little utilities that Microsoft left out. These are being distributed for free, by Microsoft, and other on-line sources, as PowerToys. (Try <http://www.microsoft.com> if you have Internet access).

PowerToys have been updated every few weeks, but as of right now, includes a number of useful enhancements. Several features are added to that handy right-click pop-up menu... for example, you can now view inside those big, compressed *.CAB files that came on your Win95 CD or diskettes, and easily find a particular file. Even nicer is the addition to the SEND TO sub-menu—by default, right-clicking on a file gets you a SEND TO choice, allowing you to send a file (or files) to the A: drive, or to a few programs. (Win 95 HINT—copy shortcuts of anything to the \WINDOWS\SEND TO folder, and they will appear on the SEND TO list... add printers, fax, applications... whatever you want). PowerToys adds a SEND TO...ANY FOLDER item, making it the easiest way to copy or move files in Explorer.

There are some nice enhancements to the audio-CD player. New to PowerToys, is perhaps the most powerful feature of all—TweakUI. This installs as a Control Panel icon, and allows the user a huge range of customization features... removal of cluttering desktop icons such as Network Neighborhood or the InBox, for example, or an easy way to get rid of the Cloud screen at boot up.

Lots of features, and the price is right. Anyone who wants more power over the Win95 environment should take the time to track down and install a copy of this one. □

About the author: Alan Zisman is a teacher and an associate editor of Computer Player, he can be reached by e-mail alan_zisman@computer-player.com

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Fastest Mac Clone Introduced

The new Power Computing Corp. has introduced what executives there say is the world's fastest Apple Macintosh clone computer.

From the firm's Palo Alto, California, headquarters, Susan Moran of the Reuter News Service notes that the new machines by Power Computing, the first company to begin making Mac clones, are built around a 150MHz PowerPC chip. Currently, the fastest PowerPCs operate at 132MHz.

Apple Licenses Newton Technology

Apple Computer Inc., looking to further expand its personal digital assistant (PDA) technology into specialized markets, is licensing its Newton platform to a pair of firms.

Schlumberger Electronic Transactions of Montrouge, France, and Digital Ocean of Lenexa, Kansas, will separately offer products based on Newton technology.

Schlumberger Electronic Transactions, a division of Schlumberger Ltd., plans to use the Newton technology in integrated "smart card" systems, which are designed to automate medical transactions.

Digital Ocean Inc., which specializes in wireless connectivity products, will combine the Newton platform and Global Positioning System (GPS) and wireless communications technologies into products for the manufacturing, transportation, health care and services industries.

"The support of our licensees is critical to the proliferation of the Newton platform as the standard for PDAs," says Sandy Bennett, acting vice president of Apple's Newton Systems Group. "With the addition of Digital Ocean and Schlumberger as Newton licensees, we expect to see an expansion in the range of innovative new solutions based on the Newton platform."



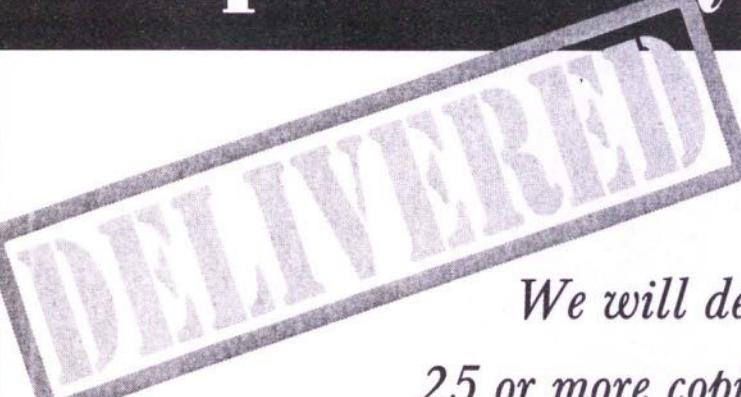
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The Lowdown on ISDN

Sean Elrington

As a byproduct of the explosion of interest in the Internet, millions of computer users are also starting to take an interest in their tele-

phone system. After all, even if you have a Pentium 100 and a 28.8 modem, your ability to enjoy cyberspace is totally dependent on the ability of your residential phone line to carry data. A poor quality phone line will make surfing the Web a painfully slow experience. Buy-

ing an expensive, high speed, dedicated data line has always been an option for businesses, however until the advent of ISDN there was little hope that the home user could ever really fly along the Information Highway.

To understand ISDN (Integrated Services Digital Network) we must understand the difference between an analog and digital telephone line. Analog telephones transmit electrical impulses

of varying intensity as a wave form - if you speak louder the signal is stronger. Digital systems carry zeros and ones and the intensity of the electrical signal does not change, because all of the information is contained in numbers represented by the zeros and ones.

When you connect to your Internet provider the sequence of events usually goes something like this:

1. Your computer emits a series of digital zeros and ones which then go to the modem.

2. The modem takes these binary digits and converts them into an analog wave form. The signal then goes to the local telephone company switch or '*central office*' (CO). The switches are located around town and are really just very large computers.

3. At the switch, the data is turned again into digital form and transmitted at high speed to the CO nearest your Internet service provider (ISP).

4. The call is then converted back into analog form and transmitted to the ISP's modem pool.

5. It is then converted back into digital again so the ISP's computers can deal with the information.

As is to be expected, valuable data is corrupted during the numerous analog to digital conversions and must be resent - causing further delays.

The telephone line between your home and the nearest telephone switching station is called the '*local loop*' and is typically analog. Starting in the late 1960s, telephone companies around the world changed their '*trunk lines*' - lines between switches - into digital systems since they are capable of carrying more information more reliably than analog lines. However, the telephone companies have always balked at the cost of replacing literally millions of miles of local loop analog copper wire with special digital lines to every home.

ISDN extends the digital trunk lines between COs all the way to your home, eliminating the need for a modem. (It has always been possible to do this if one was willing to pay for an expensive, dedicated data line to be installed). ISDN allows you to, in effect, turn the existing analog lines already in your home into digital telephone lines through software installed on the nearest CO switch. Suddenly, your analog telephone line, which might on a good day actually run at 28,800 bps, now can send and receive data at 128,000 bps.

The cost for this service is between \$70 and \$100 per month per line depending on which service plan you decide to use. The cost of ISDN is coming down rapidly in the North America - in California, for example, you can get an ISDN line for about \$20 per month.

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ISDN uses each of the twisted pair of copper lines already in your home to send and receive 64,000 bps of data per line. If you 'bond' the two pairs together you get 128,000 bps. The two lines are called a BRI (Basic Rate Interface) or 2B+D. The 'B' are the bearer or data lines and the 'D' is a logical data line for carrying signaling information the phone system requires in order to set up a call. If your ISP supports ISDN they might have a number of BRI lines installed or they might have paid a lot of money for a PRI (Primary Rate Interface) which is 23 B channels and 1 D channel combined onto one physical phone line.

To terminate a BRI you require two devices - a Terminal Adapter (TA) and a Network Termination unit (NT1). The NT1 supplies power to the line and turns the two wire line into a four wire interface. The TA performs the bonding and other control functions on the line. The ISDN line comes into the NT1 and then goes to the TA and finally is connected either directly to your PC or to a router on a LAN. A PC card with a TA/NT1 costs about \$600, while a router which has a built in TA/NT1 can cost as little as \$1800. By itself an NT1 costs between \$250-\$350.

So why doesn't everyone use ISDN?

BCTel has been much slower to roll out ISDN service than other provinces.

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BCTel's major shareholder is a large American company called GTE which makes telephone switches. Over the years, BCTel has bought a lot of these switches, which, unfortunately, do not support the software needed for ISDN. BCTel is slowly replacing these GTE GTD5 switches with ISDN capable switches from Northern Telecom and AT&T. The cost of replacing multimillion dollar switches means the deployment of ISDN is limited to urban areas. Downtown Vancouver and parts of Victoria, Kelowna and a few other cities already have ISDN access. The easiest way to see if you can get ISDN is simply to call the telephone company and ask them.

Your ability to receive ISDN depends on which switch you are using and the distance you are from it. Generally, to get it you must be within 3.5 miles of an ISDN switch, although the phone company is actively trying to extend that range.

If you thinking of using ISDN you should be aware that you might need to replace your old analog telephone and fax machines since they will not work on a digital line. One way around this problem is to look for a TA/NT1 with analog ports that you can use to support your existing equipment. Some vendors have introduced products which combine an ISDN TA/NT1 with a V.34 modem so that customers will have a smooth transition to ISDN when it becomes available in their area.

Some products, like Gandalf's 5242i Edge Router allow you to send a fax, take a voice call, and send and receive data all at the same time. If you doing a data transfer the router uses both 64K B channels, but when you pick up the phone, it allocates one data line to your voice call but keeps using the other 64K channel to send data. When you are finished your call it automatically starts sending data on the both lines again.

In my next article I will discuss Frame Relay and T1 lines. □

About the author:
Sean Elrington is the Marketing Manager of ZED Data Systems and can be reached at seane@zed.ca or http://www.zed.ca

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Stuff for Christmas

Alan Zisman

Thinking of a gift for that special computer-user on your list? Computer users can be notoriously difficult to buy for—especially if you're not particularly computer-articulate yourself. Too many well-

intended computer-oriented gifts can end up being the high-tech equivalent of that tie or sweater destined for the back of the closet.

As with other gifts, the most appreciated are ones that are picked out with some thought to the needs, wants, and most of all, tastes of the recipient—too

many of us buy gifts that WE'D like, rather than ones that we know the recipient will like.

(You can always try this technique—ask them! Or get a gift certificate from the computer or software vendor of your choice).

If you don't know exactly what they want, make sure you know a few things about them and their computer first—how old are they? Are they game players? Do they use Macs? PCs? Amigas? OS/2? There are few things more embarrassing among computer-gift givers than giving software or a computer toy that will only run on a different platform than theirs!

Some gifts are universal—boxes of floppy disks, for example. A little bland, perhaps, but always useful... and virtually all computers can use the same 3 1/2" diskettes. Boxes of ten start under \$5. Maybe for a stocking stuffer? Take a look at their computer and workspace... is their mouse pad filthy? Covered with coffee stains? New ones start at under \$5, but for \$10-20 you can get an especially cute one (again—think of their tastes, not yours!) You can even get pads with a print of their favorite photo or graphic.

Buying software for someone else can be pretty tricky, unless they've dropped pretty specific hints about what they want ("Gee, Mom, that SimCity 2000 sure looks neat!"). Games, screen savers, sounds, and more can make nice gifts—but they're like buying music... there are lots of different tastes and desires. And as always, make sure you get something compatible with the computer platform—giving a Mac user a Windows program is sort of like giving a music fan an 8-track tape for their CD player.

You might want to get a subscription to a computer magazine as a gift... but don't just grab the first one on the shelf—like lots of other areas of publishing, computer periodicals have gotten increasingly focused... there are magazines for PC users, Mac users, etc., for beginners, for programmers, for the technically oriented, for game-players. I've counted half a dozen magazines

specializing on the Internet. Again, try and think of what how the person getting the gift uses her or his computer—especially when they're NOT at work. Then make sure they don't already get that magazine.

Recently, I went Christmas shopping at a computer superstore with Sammy Ho, Jim Edmonds, and my eleven year old, Joey. We were searching for gifts for various age ranges, and at a variety of prices—the sorts of things that could be fun, maybe a little quirky, that our favorite computer users might like, but often couldn't justify buying for themselves.

For The Kids

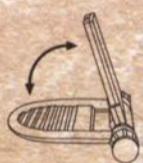
Software that is both fun and educational ('edutainment') is getting better and better... but most of it is now only available on CD-ROM. Make sure the child's computer has a CD-ROM drive before buying these. Classics include Broderbund's Living Books series, and Microsoft's Magic School Bus. For the very young, these have been joined by Fisher Price titles, such as Fisher Price's 123s. Prices range from \$45 to about \$70. For somewhat older kids, check out The Learning Company's offerings (also available on floppy disk), such as the various SuperSolvers programs (about \$50). All these programs list the suggested age range on the box—make sure you get something that's age appropriate. All these programs have both Mac and PC versions.

Small children often have problems with adult-sized mice, particularly the super-jumbo models such as the comma-shaped Microsoft Mouse. Smaller mice start at around \$10 for a model from Genius, while both Microsoft and Logitech have offerings aimed at home or children, for about \$60. There are even colorful replacement keyboards, aiming at younger computer users.

Popular games with all ages this season include the new 1996 version of NHL Hockey and Mortal Combat 3 (both about \$70). For the same price, surprise an OS/2 user with IBM's OS/2 Fun Pack.

If the seeming high price of games makes you want to rule them out as gifts, there are more and more available at relatively bargain prices. For example, you may be able to find re-releases of older software, with a sub-\$20 price tag... I saw products like Chuck Yeager's Air Combat, and a PGA Tour Golf/World Tour Tennis combo at that price range. Comics fans might enjoy the X-Man Interactive CD, also at that price.

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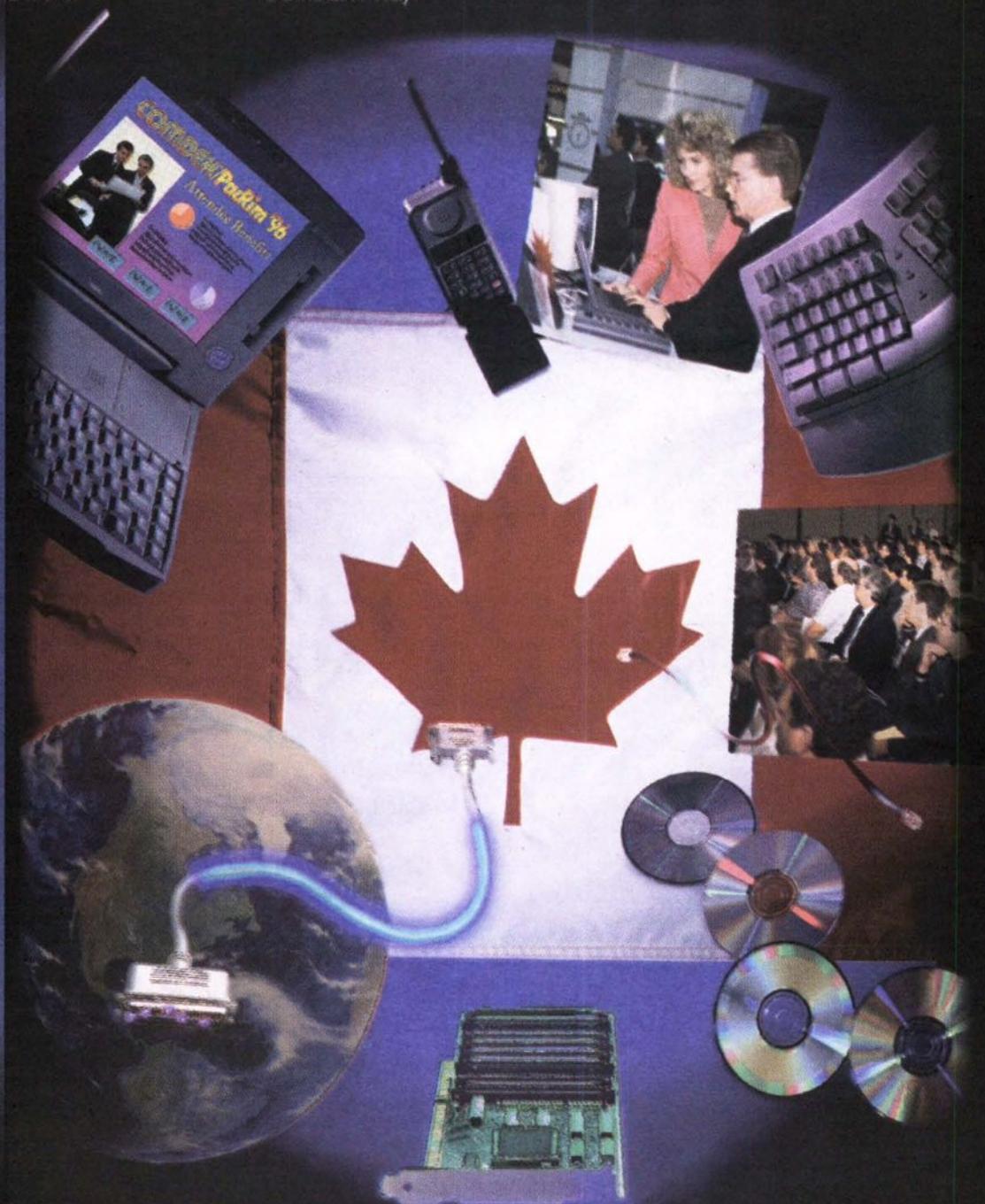
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Gamesters often find the standard computer keyboard + mouse combo frustrating... take a look at joysticks and gamepads. Burnaby's Advanced Gravis makes a Nintendo-like PC GamePad for about \$20. Joysticks start at that price, and quickly move up— one current fave is SunCom's Raptor, which resembles a fighter plane stick, costing about \$89. For \$70, you can get a bundle including the new MegaMan X game, along with an innovative 6-button game controller.



Older At Heart?

There are lots of options for the older computer user, as well.

Planning a trip? Maybe Rand McNally's TripMaker (\$59) will help make it more enjoyable. Or how about a trip to Cyberspace... if the recipient already has a modem, but isn't yet hooked into the Internet, there's the Internet Canada Access kit, which for \$20 includes all the necessary software, and a 20 hour credit on the cross-Canada Access service. Similar bundles are available from most local Internet Service Providers.

Gift-givers with deeper pockets might want to speed up someone's modem. A user stuck with an old 2400 bps modem will be thrilled with a \$149 Sportster 14.4 model, while a 14.4 owner will love you forever for a \$300 Sportster 28.8.

Less expensive gifts can help computer users manage clutter— copy holders for around \$40, CD holders under \$10, Multimedia Organizers under

\$20. Improve someone's health and safety with an ergonomically-designed gift... keyboard and mouse padded wrist rests for \$15 each, or up to a redesigned keyboard, such as the \$100 Microsoft Natural Keyboard.

Screen savers once helped protect monitors, but now are mostly for fun and decoration. For about \$50, there are a wide range available, often with comic book, movie, or cartoon themes, allowing you to find the perfect one for that special person. For the graphics user, CDs have made it possible to distribute huge numbers of pictures at a much lower price - such as ClickArt's 25,000 picture ImagePak for \$70.

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Which best describes your firm's primary business? (check one only)

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- Distributor/wholesaler/hardware manufacturer/OEM
- Software developer
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- Other third party and allied service firms

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- OS/2/Compatibles
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- Networking
- Unix
- Macintosh

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- 1,000 - 1,999
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- 250 - 499
- 100 - 249
- 20 - 99
- Less than 20

What are your firm's approximate gross annual sales? (check one only)

- Over \$50 million
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- Over \$10 million - \$25 million
- Over \$5 million - \$10 million
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All questions must be answered. Incomplete cards will not be processed. The publisher reserves the right to determine qualification.

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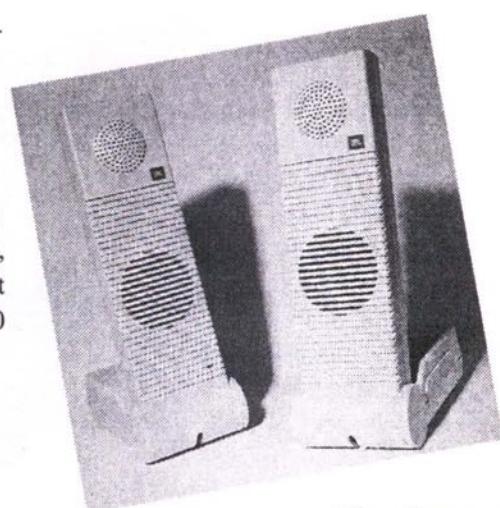
If your special someone hasn't yet added sound to their PC, a sound card such as the Sound Blaster 16 Value Edition will cost \$149... but add to that the price of a pair of speakers... from \$20 on up. If they DO have a pair of \$20 speakers, you may want to improve their sound quality— better speakers, with a sub-woofer for more impressive lows,

start about \$90 and can go up to about \$170 or more.

If sound seems to frivolous, what could be more practical than a surge protector? Is the computer safe from power surges or lightning bolts? How about the modem in the phone jack? Very cheap powerbar-type surge protectors are actually pretty useless, but models that do

protect start at \$39, with more protection available for about \$100 or so. Make sure there are phone plugs for those modem lines.

Notebook users would appreciate a bag for their computer, with room for some file folders, cords, disks, modem, and all. Colorful cloth models start around \$50, with prices going up to \$200 for classier leather.



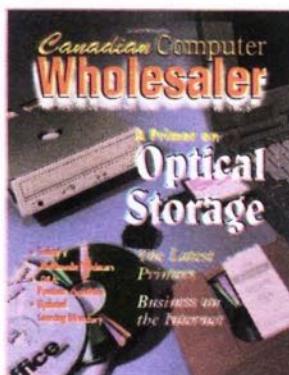
Then there are

the gadgets and gizmos. Scanners allow users to digitize pictures and text— getting them onto their computer screen where they can be added to documents or manipulated in all sorts of wonderful and wacky ways. Black and white ('grey-scale') models start just over \$100, while colour models costs closer to \$300. For the same price, check out Snappy... a little unit that lets you capture still shots from a TV or video player. One bargain unit is the Connectix QuickCam— around \$100. This ping-pong ball-sized gadget is a real video camera that plugs into a computer, allowing still or full motion (black and white only— what do you want for \$100?) shots. The Windows version may be in the stores by the time you read this - the Mac version should be available now.

Upping the price point, there are more and more gadgets... tape backup drives for under \$300, for example (if she/he already has one, a couple of tapes are more affordable, but still appreciated gift). A cordless mouse from Logitech, for \$137 to get rid of some of those desktop wires. An 850 meg hard drive for \$400 or so.

Or if you're nowhere near those price ranges, how about decorative laser paper? Lots of different styles, about \$10 a pack. In fact, special Christmas paper, for \$5 a pack, lets you laser print letters home, on an attractive, pre-printed background.

As you can see, there are a wide range of presents available at various prices for computer users of all ages. If forced to choose, Joey narrowed down his choices to *MegaMan X* or *NHL Hockey '96*. (Are you reading this, Grandma?) As for me? Oh, anything will do, thank you. □



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STTING A Final Unity - details are there for the patient

(Continued from page 43)

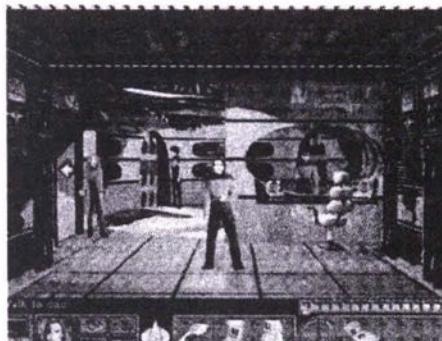
immense powers, just make sure you find it before the Romulans. There are plenty of other smaller missions and duties to keep you busy as well, as any Starfleet graduate would know. Take over the helm and send the Enterprise into warp 9.2, or command the tactical display in the middle of a phaser firefight, and there other posts to command as well. Too bad you can't really go anywhere but the bridge.

When the time comes for an away mission, pick your team carefully (if you're a cadet just take who they give you). Every team member has certain skills: Data and LaForge can give you info on scientific or technical subjects, Worf is a good shot with a phaser, and Troi can give you insight into what the aliens you encounter are thinking.

Don't hesitate to ask them for advice because you'll usually get a pretty straight answer if you do. Everything should be scanned as only a tricorder can reveal an object's true purpose.

This game does have flaws though. As with most adventure games *A Final*

Unity is packed with standardized puzzles/mazes and meaningless dialogue. If you thought an episode of Star Trek could drag on, wait till you see this game, it is too often tediously slow



(I once waited, on my 486-25 w. 8 Mb, five minutes staring at the screen while the ship moved to another sector at maximum warp).

The verdict is, if you have the patience and enthusiasm for the Trek universe necessary to complete this game, then maybe this game is perfect...for you. □

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Business on the Internet

Traffic. Something we all like to avoid in the physical world. Something we all want more of on the web. A good internet marketing strategy can generate excellent volume and maintain constant traffic. For those who lurk, you have designed an attractive and appealing web site with excellent information about your company and industry. For those wanting to do business, you must now accommodate the needs of those who approach.

A well designed site will already have incorporated different ways for potential business to approach. These can vary from simply advertising an 1-800 number to integrating elements of consumer psychology right into the interface of the site. Despite your budget, it is imperative to supply more than one reason why people should contact you instead of the one million other sites they could choose. This may be accomplished through cross-promotional strategies with traditional media, online games or contests, an excellently designed electronic shopping interface or joining a forum or mailing list. Regardless, interesting and easy ways for potential business to communicate with you is a must.

Communicating Across the Internet

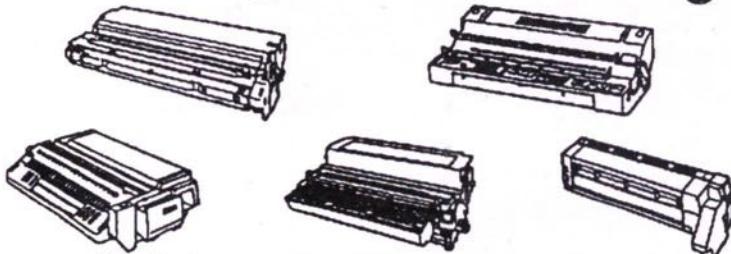
When someone phones your business, they can connect to another person and usually deal directly with someone (synchronous communication - no delay) who can help them. With e-mail, much the same as voice mail, there is no direct contact (asynchronous communication - some delay) and the need for prompt response increases dramatically! It may not be that you respond to e-mail immediately, although when connected most mail programs will alert you when you have new mail, however, when it only takes a few seconds to send e-mail across the globe, a prompt response is expected. Many businesses check their e-mail at regular times (8:00am, 10:00am, 1:00pm, 3:00pm) so often you receive a response the same day.

Mailing lists and automated mailouts are a great way to provide lots of specific information that may be easily passed over on the web. They can also provide an added value to the content of your web site and to the services your company offers. With the recent influx of users onto the net most forecasters are speculating about the future of Usenet newsgroups. The replacement? Private mailing lists, listserves and forums. Create an e-mail newsletter that provides up-to-date industry information and intelligence. recent

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changes to your web site or new promotions. When you provide the option of receiving this type of information or not, you are adding value to your website and inviting potential business to make contact with you.

FAQs are another easy way to communicate essential information about an industry, product or service. In the spirit of DIY (do-it-yourself) people online peruse read me files and FAQs and are being referred to them constantly. Creating a well laid out, easy to navigate FAQ can not only provide resource material to users but demonstrates a company's concern for service and familiarity with the internet. FAQs can be an incredible educational resource and give your web site added value.

Fax back technology is another innovation that is an easy and inexpensive way to provide information for potential business and allow users to interact on the web. A simple form which outlines the content they would receive is used to display options and insure they receive what they are looking for and not irrelevant information. Once this is selected another simple form acquires the necessary company and faxing information. Once the fax button is pushed the requested information is accessed and faxed to the office. Because every business has a fax machine and the

move to incorporate digital business environment technologies is in progress, faxing from the web is an excellent way to bridge the gap between the accepted way of doing business and the new and developing ways of doing business. This is an inexpensive venture for distributing hard copy information and a way for your company to lead others into the future.

Webchat or Hypernews are two great products. Webchat (<http://www.irsociety.com/webchat.html>) or other interactive communication tools for the web are excellent marketing tools. Webchat is an asynchronous web environment where people can post messages, GIFs or other files to be viewed in what is called a room. A room is a particular web environment where those in the room view the postings and respond. Rooms can be specific to topic, industry or interest. With the fully supported version and Netscape 1.1 viewing the postings can be refreshed at an interval the user chooses providing a near synchronous mode of communications with people on the web. Webchat can also support online lectures, presentations or interviews which provide real-time exchanges between people that would not have otherwise met.

Hypernews (<http://union.ncsa.edu:80/HyperNews/get/hypernews.html>) is just as it sounds: a hypertext newsgroup on

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the web. It functions identically to an Usenet newsgroup yet exists solely on the web. Industry related topics can be discussed, market feedback or public opinion can be gathered by interacting with others on-line. Universities across North America were using the Internet for exchanging ideas, soliciting opinions, tracking data and other functions long before business got wind of the concept. Going online to gather strategic information and learning about markets is as easy as creating a forum for discussion and inviting people to respond with their knowledge and experience.

Communicating Within Your Company

Web technology can also be used for some dynamic methods of communications. Companies with offices spread out geographically can now keep in touch in ways never before possible. Remember the e-mail alert? I have had business conversations through e-mail with people in Seattle. Three or four messages back and forth and we had accomplished the same thing we would have on the phone and fax but with less expense.

Think of the virtual boardroom. Over the weekend you receive an e-mail message telling you to look over a presentation on the web. The URL is listed with a password for entry to a protected area. You enter the password, press the enter button and watch as a message appears and is replaced by another periodically giving you a brief synopsis of what you're about to see (server push/client pull) (take a look at this site for an excellent example of push/pull <http://www.interverse.com/html/aside/aside01.html>).

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After the brief synopsis is finished you now have the opportunity to make your way through an interactive business project on the web. With the recent advances of Netscape 2.0b you now are receiving real-time interactivity with no page downloading (<http://www.maoromedia.com/>). Graphs are animated to show changes in the market, text moves across the screen without you clicking on anything and the presentation comes to a close with a voice inviting you to respond and read other responses in a forum online. Suggestions and criticisms are posted and analyzed by everyone.

Monday morning you sit down at your desk checking your e-mail and there is a confirmation message of your presence in the site during the weekend. A final report summarizing the objectives and criticism gathered on the web comes as an attached file with the mail. A decision on the project with assigned tasks has been made and you will be notified of the initial project management meeting.

Web technology is already being used internally in many companies. Automated web page creation, adding sketches, sound or video presentations make the web the ideal medium for messaging departments or coordinating communications between departments on key projects. Archiving and linking previous or relevant information from other projects is another excellent time saving resource that can be accomplished on the web.

Web technology is advancing at an incredible rate! Accommodating many new features every few months, companies now have the opportunity to conduct business in ways never before available to them and in front of audiences only network television could reach. A client called and mentioned that he spoke with his computer consultant. The consultant told him that his business probably would not benefit from the web for another six months or so and to hold off developing a web site. Would it not make sense to develop now in anticipation of that time? To familiarize yourself with the internet now in preparation for that time? Would that not give you an advantage over your competitors when the time is right? Thinking like this consultant could leave you trailing your market instead of being ahead of them. Missing opportunities that first arise from doing business on the internet.

Next month we'll look at online transactions (SSL, secure socket layers), commerce servers and digital cash.

About the author: **JD Miller** is a principal of Vancouver Internet Publishing and can be reached at je3d@van.com.

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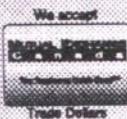
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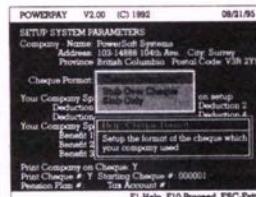
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Most Influential Execs Named

For a record third time, Computer Reseller News has put Microsoft Corp. Chairman and CEO Bill Gates at the head of its annual Top 25 Most Influential Executives list.

Gates has been a part of the computer industry trade journal's list for all but one of the past 13 years. He's the only individual ever to have topped the list more than once, also claiming the No.

- 1 position in 1986 and 1991.
2. Andrew Grove, CEO and president, Intel Corp.
3. Lewis Platt, chairman and CEO, Hewlett-Packard Co.
4. Eckhard Pfeiffer, CEO and president, Compaq Computer Corp.
5. Chip Lacy, co-chairman and CEO, Ingram Micro Inc., and CEO, Ingram Industries Inc.
6. Louis V. Gerstner Jr., chairman and CEO, IBM Corp.
7. Eric Benhamou, chairman and CEO, 3Com Corp.
8. Marc Andreessen, vice president, Technology, Netscape Communications Corp.
9. Craig Goldman, chief information officer, Chase Manhattan Bank N.A.
10. Larry Ellison, chairman and CEO, Oracle Corp.
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全球資訊網

< 第一部份 >

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如果您不知道目前臺 在 WWW 的成果，那您就真的太可惜了？

本期先介紹由筆者所收集臺 目前所有“教育機構”、“研究機構”及“政府機構”的 Web Site，下一期將會繼續

介紹民間組織、商業公司所成立的 Web Site (商機都在這裡)。

要查詢這些資料前，您必須要先具有以下的東西：

- 1) Chinese Windows (Big5 Code)。
- 2) WinSock Driver。
- 3) NetScape (或相容的瀏覽器軟體)。
- 4) 向任何一家 ISP 申請 Internet 帳號。

有些 Site 同時具有中、英文兩種顯示方式 (大部份都只有中文)，但仍強烈建議各位使用能讀取中文 Big5 碼的環境。

在加拿大這裡除了 C-WIN 之外，您也可使用英文 Windows 再加上“漢文道”或“雙橋”的方式，來達到讀取 Big5 資料的目的。如果您覺得加裝這些軟體對您來講，會很對不起自己的荷包，那當然還有第三種方法:-)

第三種方法當然不是要您乾脆不要看 Big5 的東西！有興趣的人，可以打電話來問問筆者，或者直接上筆者所設立的 BBS 站來問問我吧 (BBS: (604) 821-1046)！

以下就是目前臺 大部份的教育機構所設立的 World Wide Web 資料。

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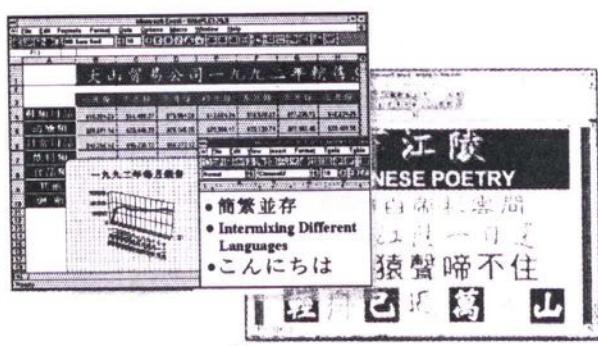
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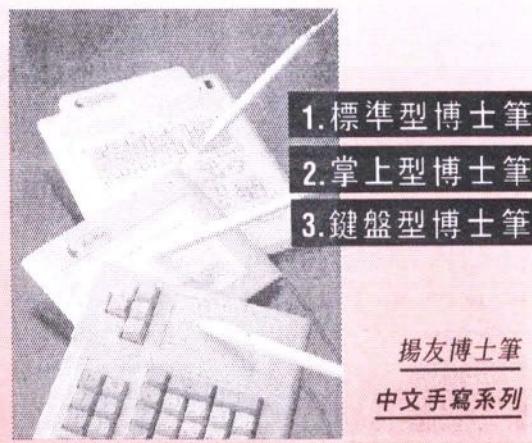
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本期完，下期待續

作者：林啓濬先生目前職務：中華民國電腦通訊業餘網路協會 常務理事；中華民國電腦通訊業餘網路協會 活動委員會 主任委員；中華民國網路協會 BBS 委員會 主任委員；第三波雜誌 編輯顧問；光碟雜誌 編輯顧問；加拿大電腦世界雜誌 (Computer Player) 專欄作家。相關著作：BBS 電腦通訊站入門與架設實務 (立威出版社)；BBS 電腦通訊站技術秘笈 (第三波)；Maximus BBS 架設實務 (資訊與電腦)；BBS 電腦通訊站使用入門 (倚天)；小朋友學 BBS (長諾)；數據通訊教材系列 — BBS & Internet 入門篇 (松崗)；資訊高速公路導覽 -- Internet Yellow Book (松崗)。

中文 Windows 95 開始接受預約

隨著 Windows 95 在八月下旬推出之後，Windows 95 中文在繁羅密鼓的籌備之下，也即將於十二月間正式與千萬觀眾見面了。目前搶鮮版在台北收費推出之後，有許多人已經在電腦上領略了此一新作業環境的風采，十二月間恆碁公司將會在最快時間推出介紹給加拿大地區的用戶。同時，今年十二月也是恆碁在溫哥華公司成立的第四年，特別推出預約優惠辦法，對 Win95 中文版有興趣者可以和恆碁公司聯繫。

高檔次中文手寫筆 -- 精品漢筆 在溫哥華正式推介

目前在港台地區流行多間公司的電腦中文手寫筆，其中〈蒙恬筆〉、〈精品漢筆〉系列一般被認為是高質量的強勢產品，由於辨識率更加準確，因此定價也比其他產品相對的高，恆碁公司在加西地區代理推出這一新系列提供用戶有更多的選擇。更以最優惠價格優待所有用戶。這套產品系列

支援簡繁體中文系統、字庫，可以在中文視窗、雙橋、中文之星等著名的 Windows, DOS 環境裡輸入中文而不須去練習繁複的中文輸入法，至於全螢幕書寫、先寫後認、香港字集等功能都是新系列裡不斷增加的特色，這項產品在溫哥華有專人示範，另外，也可以安排到社團機構說明介紹。

中文 Internet 電子網絡通訊雜誌

恆碁公司為配合當今最熱門的 Internet 網路熱潮，本月間將推出一份〈中文 Internet 電子網絡通訊雜誌〉，這份雜誌將以 EMAIL 的方式傳送給讀者（日後計劃推出 WWW 版），以中文為主，介紹網路新話題、有趣的 WWW 資訊網地址、網上文章選讀、新工具推薦、中文軟件、電腦新書、遊戲選介等等。這份刊物以恆碁會員為主要訂戶，免費贈送，有興趣的一般讀者，如果其電腦能支援中文，具有 EMAIL 地址者，也歡迎提出申請。申請表格請洽問該公司。

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版）。新書方面，有〈Windows 95 系統入門與精修〉、〈Coreldraw 5.0 應用〉等，部份新書還會陸續運來，部份產品接受預約。For more information, contact B.I.S. Information Systems. Tel/Fax: 604-6888916

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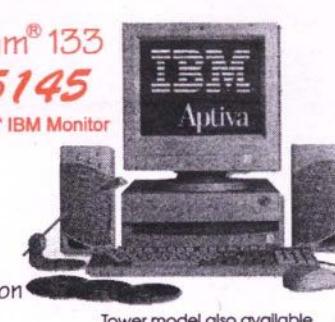
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Cold Water and Clocks - inside the motherboard

(Continued from page 38)

memory bus arrangements running in parallel. The CPU may generate a reference for four bytes of data, but the memory controller on the main board fetches eight bytes. Half of the data fetched is used to satisfy the current instruction, the other half is buffered for a cycle.

The design of a 486 with internal cache and a 16-byte burst provides the opportunity for interleaving. Immediately after the CPU fetches the data needed for an instruction, it will continue to fetch the remaining 12-bytes immediately around it. With interleaved memory, the next four bytes have been anticipated and are immediately available. Even better, while the second four bytes are being transferred to the CPU, the memory controller has already started to fetch the second block of eight bytes.

Since the memory cannot be made to run any faster, interleaving doubles the effective speed of the memory by moving twice as many bytes in the same amount of time as an ordinary 32-bit bus. Of course, it adds complexity to the main board and forces memory to be installed in pairs of matching SIMMs.

In simple cases, interleaving matches the speed of the memory to the speed of the CPU. A 33 MHz processor operates on a 30 ns cycle. RAM operating at 70 ns takes slightly more than two cycles to respond. However, a device that processes four bytes every 30 ns is approximately matched by a device that delivers eight bytes every 70 ns. Interleaving therefore speeds up the memory subsystem without actually speeding up the memory.

The SX, SLC, and DX

The chip suffix letters were once meaningful. They have now degenerated under an avalanche of marketing pressure. What does GT or LTD really mean

on a car? Well, a 486 SLC means about the same thing.

There are three considerations in an Intel or compatible CPU chip:

- 1.) How many data bytes does it transfer to or from memory at a time: 16, 32, or 64?

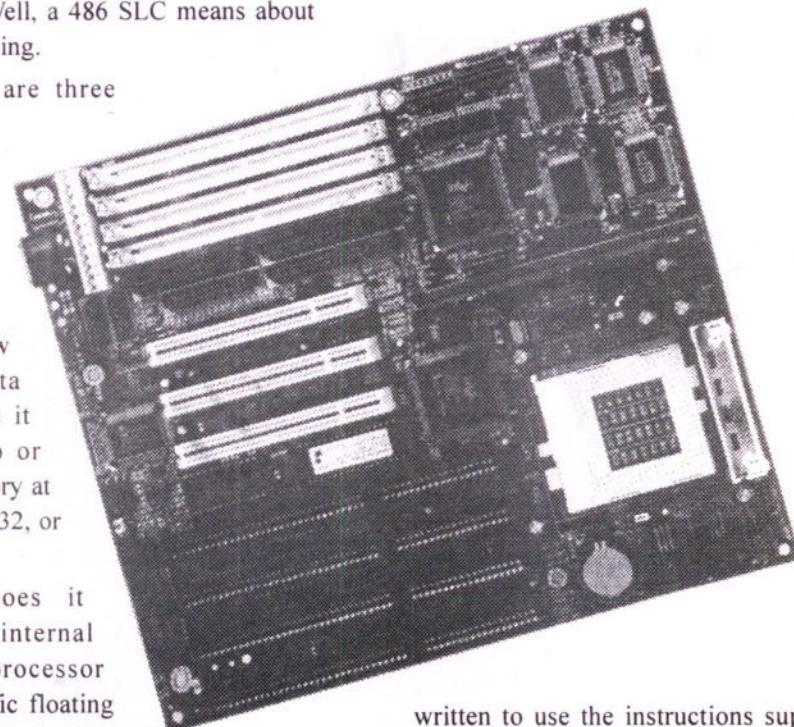
- 2.) Does it have an internal math co-processor for scientific floating point calculations?

- 3.) Does it operate at laptop low power (usually 3 volts) or desktop high power (usually 5 volts)?

There is also the question of how much internal cache does the chip support, but that depends more on the vendor than on the suffix of the chip.

The whole SX/DX mess got started when Intel introduced the 386 SX chip. It has a 16-bit path to the memory and supported only 24 address bits (allowing a maximum of 16 megabytes). In current use, the IBM 486 SLC and SLC2 chips have the same data and address restrictions. The original SLC family may no longer be part of the IBM product line, but it appears in certain IBM-made main board upgrade kits that can be purchased to convert an old 386 machine to some type of 486 machine.

All other chips in current use (SX, DX, DX2, SL, DLC, etc.) all support a 32-bit path to memory and a 32-bit address. In the true Intel 486 family, a DX, DX2, or DX4 chip has an internal math co-processor (a Floating Point Unit or FPU). You are probably aware of this after the Intel blunder. This is important for scientific, statistical, or mathematical calculations. It does nothing for ordinary word processing, spreadsheets, or even graphics packages. A program must be



written to use the instructions supplied by the FPU.

Since ordinary business applications (word processing, spreadsheets, database) do not use floating point instructions, it used to be possible to save a few hundred dollars and buy the less expensive Intel 486 SX chips. Unlike the 386 SX, where "SX" meant a 16-bit path to memory, a 486 SX chip has a full 32-bit path to memory, but no floating point unit.

Over the last year, Intel has increased its production of Pentium processors and dropped prices on its 486 DX chips. On a new machine there is little to be saved by taking an SX chip without the floating point capability over a DX chip that has it. Although the floating point may have little effect on the actual performance of the machine, at this point the reduction in resale value would probably outweigh the additional cost (if any).

Intel has confused things by adding an SL family of chips with low power requirements. These are used in laptops and "Green" desktop units. It appears that some SL chips have a floating point unit, and some do not. It is necessary to read the fine print to know what an SL system provides.

Well, that's a rap for this month so I hope this gave you a small insight into the computers Memory CPU's, Motherboards, and Caching. □

Keep smiling and Happy Computing.

About the Author: **Rick McLaughlin** is a leading computer consultant from New Westminster and can be reached at (604) 521-6831 or E-Mail: rickmc@wimsey.com (or) E-Mail: rick_mclaughlin@mindlink.bc.ca

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Charitable Giving With An Advantage

Richard K. Acton

With the season of Christmas giving coming and year-end tax deductions on our minds, Bruce Maybank, C.A., an associate in our firm and I recently had a discussion about charitable giving. I thought some of the points in our conversation would be useful for many of the readers of this column. Knowing that Bruce had developed knowledge in the area, I asked him to write this month's column. The subsequent paragraphs are Bruce's thoughts on this issue. If you wish to reach him to discuss any of these matters further his business phone, which you will find at the end of the column, is the same as mine.

Charities are everywhere. Chances are you've been asked to donate to charities at work, on the street, and in your home. With such a demand for giving, and for most of us, such a limited amount of resources, it is becoming more important to plan your contributions to ensure your dollars reach the charities that matter most to you.

Charitable organizations too must plan their spending. As funding available through government sources is reduced, both the dollars raised today and in the future become more crucial to the continuation of the organization. Charities are focusing not only on "present gifts" or cash and non-cash assets, but also on "deferred gifts" of major contributions that will allow them to more accurately forecast their funding for the future.

Not only can giving to charity be personally satisfying, it can also be beneficial at tax time. If you want to take advantage of the tax benefits of charitable giving, individuals must first ensure their chosen charity is a "registered charity" as determined by Revenue Canada. In doing so, an issued "tax receipt" will be valid and can be used as a "tax credit" from income tax that would normally be paid.

Secondly, decide on the method and amount of your contribution. A cash donation will entitle you to a tax credit equal to 17% of the first \$200 donation and 29% of charitable donations over \$200. When the provincial tax is calculated the combined effect is approximately 25% on the \$200 and 44% on the excess. There is a set limit of 20% of an individual's net yearly income.

Corporations may also deduct 20% of their taxable income. If you are the principal shareholder in a closely held corporation and are considering a sub-

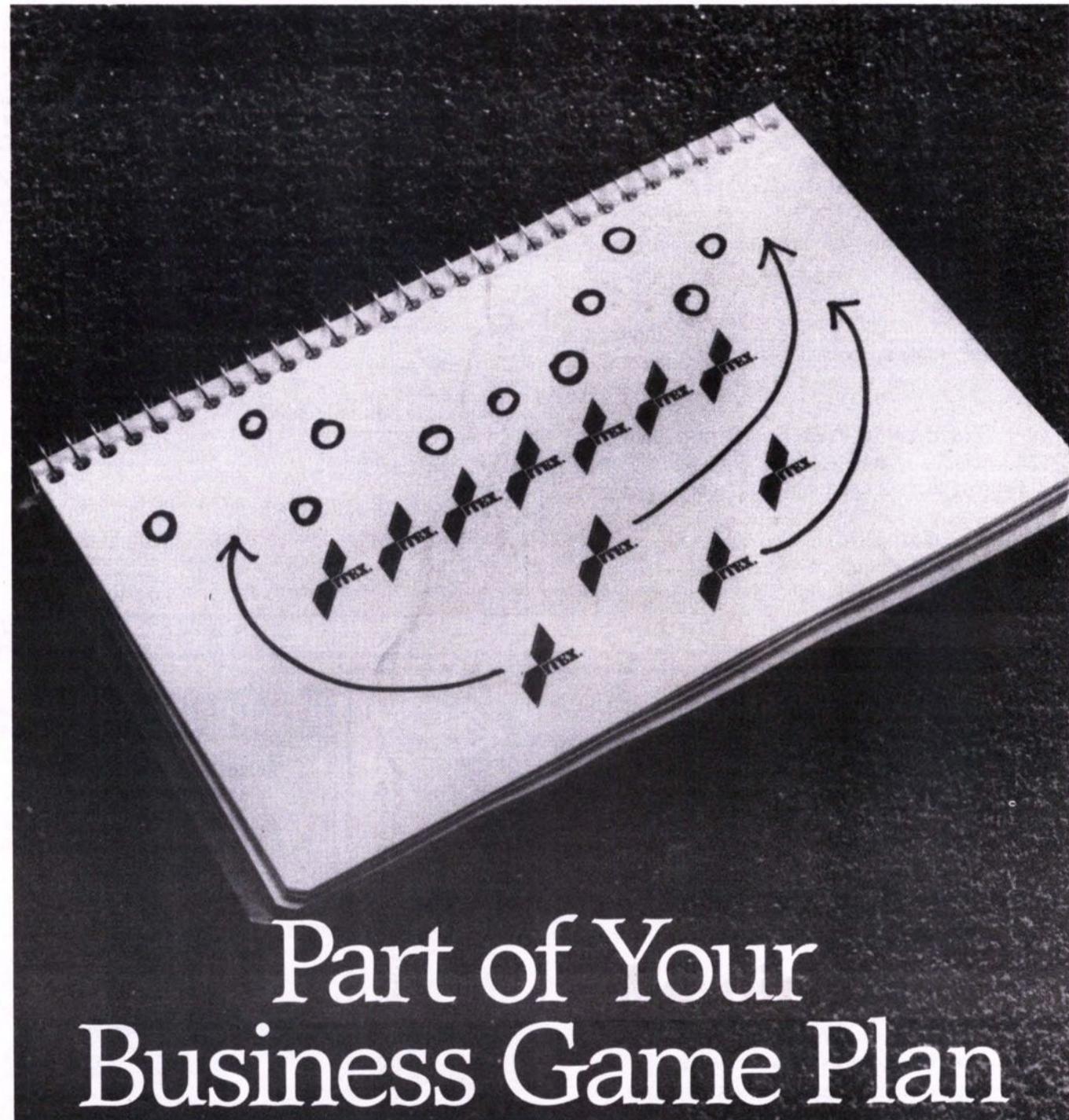
stantial donation, you should meet with your Chartered Accountant to determine whether a contribution by yourself, your corporation or both will provide the best results from an income tax perspective.

"Gifts to the Crown" or "gifts of certified cultural property" are NOT limited to 20% of net yearly income and therefore could effectively reduce an individual's income to nil. "Gifts to the Crown" are defined as those made directly to a government body such as the National Gallery, a university or hospital foundation (such as the B.C. Cancer

Agency) or to the federal government or a provincial government.

Charitable donations made through payroll deductions are a relatively painless method of contributing to your chosen charity. By donating small amounts on a regular basis, the overall contribution can be sizable. As the donation ap-

(Continued on page 68)



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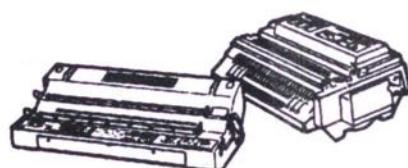
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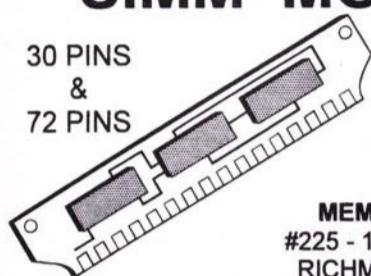
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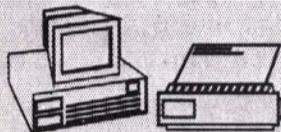
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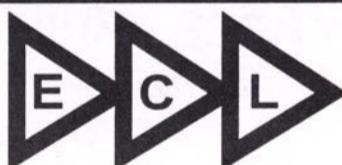
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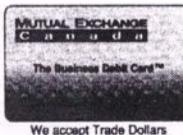
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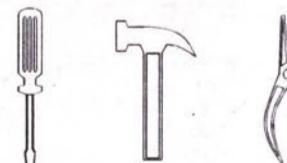
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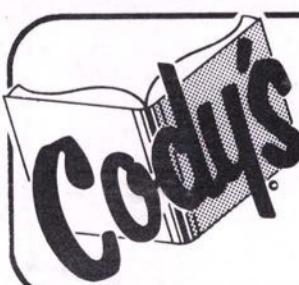
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Charitable Giving With An Advantage

(Continued from page 65)

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In addition to these "present gifts" of cash, charitable organizations also receive non-cash assets as donations. These would include such items as land, corporation shares, or art. The donor would receive a tax receipt equal to the fair market value of the asset.

A growing number of individuals are choosing "deferred gifts" as their preferred method of donation. This refers to gifts arranged today but not received by the charitable organization until some time in the future. Deferred gifts include life insurance policies, wills, annuities, and trusts. They can be relatively easy methods of giving that do not affect your current standard of living.

Life insurance policies can be attractive for both the donating individual and the charity and can be accomplished in two ways. First, the donor can sign over an existing policy that is no longer required for its originally intended purpose. In this case the cash surrender value is tax deductible. Alternatively, a new policy can be purchased

with the charity being named as the sole owner and beneficiary. All premiums paid are deductible for income tax purposes.

Wills or bequests are a popular means of donating to your chosen charity. There are Gifts of Residue, Fixed Sum Gifts or Gifts of the Whole Estate. Such bequests are eligible for tax credits and can considerably reduce estate taxes payable after death.

Money or property may also be transferred to a charitable organization through trust provisions. Under the trust's terms, the individual maintains the use and enjoyment of the property until death. When the property is transferred to the charity, a tax receipt equal to its present

value is issued to the estate.

Remember if you want deductions for 1995 you need to make your contribution by December 31st and ensure the receipt you receive is properly dated.

With proper planning and sound financial advice, it is relatively easy to make a present or long-term commitment to charitable giving without affecting your current lifestyle. Whatever method you choose, seek the advice of your Chartered Accountant beforehand to ensure you receive the tax advantages you deserve. □

About the author: **Richard K. Acton, F.C.A.** is with Acton Gunderson chartered Accountants. He can be reached at (604) 734-4871 or (604) 734-9211.

Living Better With Barter

John Madsen

In many respects, choosing to own a business is a lifestyle decision. People buy or start a business because they want the freedom, the flexibility, the status, and the rewards that go with owing and building a business. All too often the dream ends differently.

At some point people frequently discover the business owns them rather than the other way about, and the employees are the ones with time on their hands and the money to enjoy it.

It doesn't have to be this way for business owners that put all their business resources to work and focus on priorities:

#1. Business people must remember that working harder and longer are poor substitutes for working smarter. Time to enjoy life will be there for business owners who plan and manage for it.

#2. Owners must always keep in mind that where day-to-day business success is concerned, cash flow is king. If there's money in the company to pay the expenses and leave a cushion besides, the enterprise will do well and business owners will have more time when there are fewer crises to manage.

Barter can't help with the first of these other than helping business owners find a business consultant or time management trainer on trade. However, when it comes to conserving a company's vital cash flow, barter itself is king and ITEX is the unquestioned leader in world barter networks.

Virtually every business has some kind of a surplus, whether of product, billable hours, or production capacity.

The surplus may manifest itself on a regular basis, or appear periodically, like the post-holiday doldrums in retailing or the off season slack periods in the travel industry.

Companies belonging to ITEX Bartercard can sell this surplus for Trade Dollars. Frequently, these Trade Dollars are used to pay business expenses, however, that's not the only way they can be spent. Another use is to improve the standard of living of those who devoted their time and resources to building the business in the first place.

Many business owners might be reticent to take a substantial amount of cash out of the business to go on a luxury vacation or to pamper themselves with expensive possessions and entertainments. On the other hand Trade Dollars are earned selling the company's surplus, so Trade Dollars represent sales the company wouldn't have otherwise had.

Partly because it has such an extensive network, ITEX can offer its members a wide variety of vacation destinations, recreation and entertainment opportunities, and luxury products. Many members take advantage of these offerings largely because they see them as earned from their excess rather than from the cash the company needs to prosper and grow.

As the ITEX global network continues to expand, there will likely be many more opportunities to live better with barter. □

About the author: **John Madsen**, a Chartered Accountant by profession, is President of ITEX Bartercard and may be reached by E-mail at john_madsen@mindlink.bc.ca or fax 604 521-7944.

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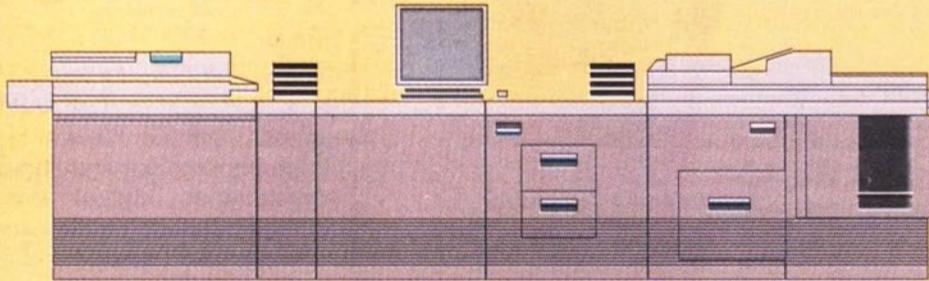
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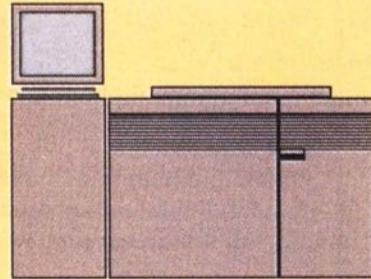


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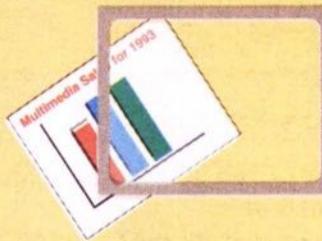
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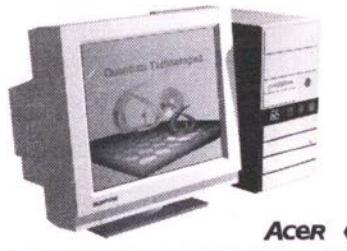
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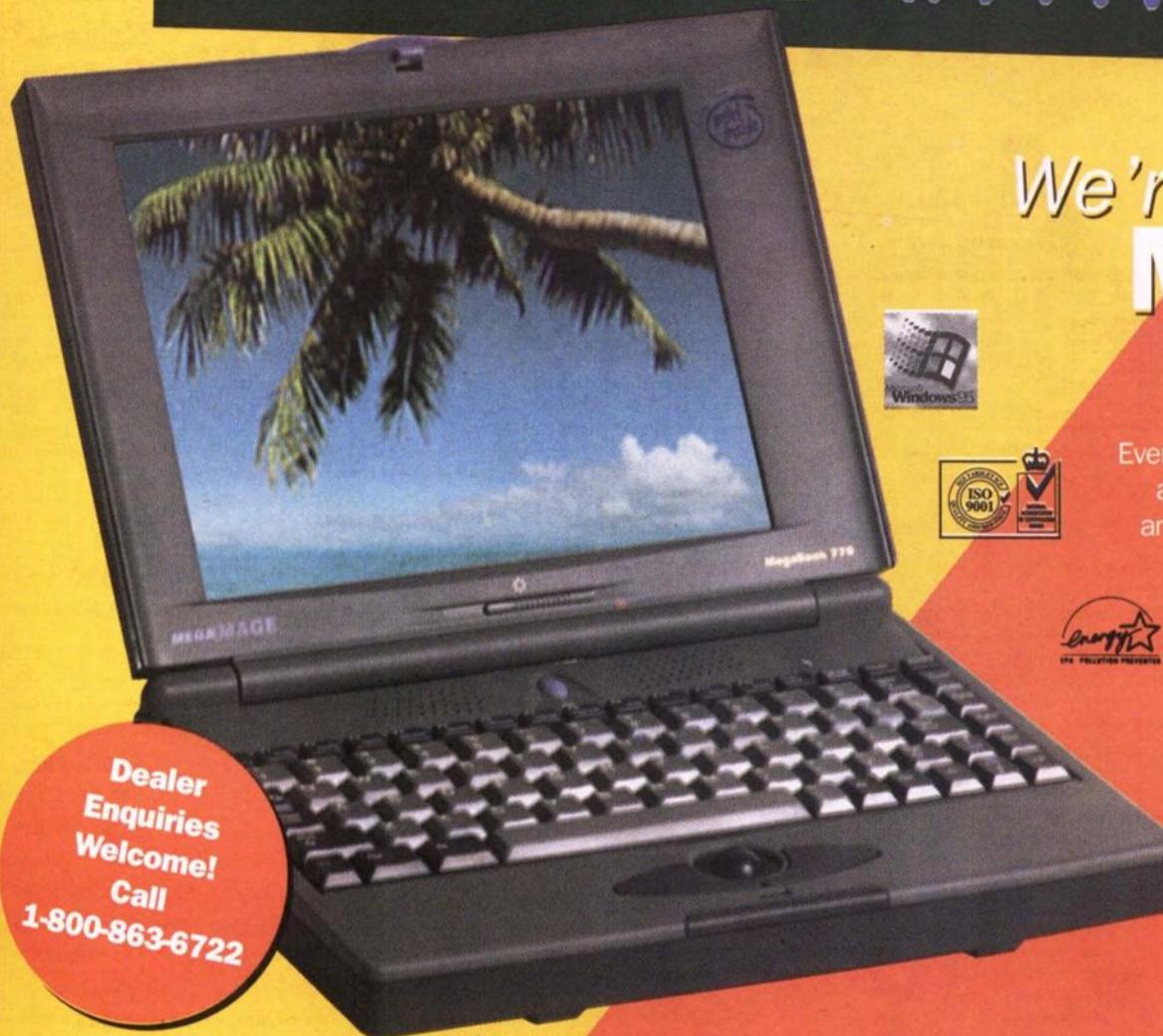
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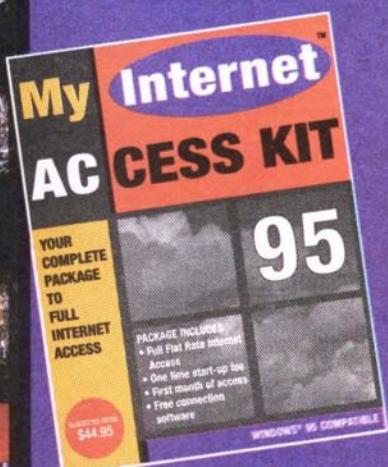
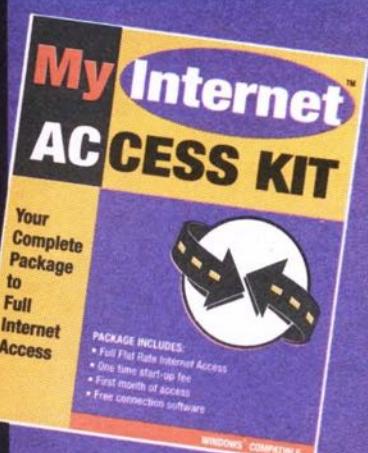
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